

Catalytic Effects of IMF Agreements on Foreign Direct Investment (FDI) Inflows in Sub-Saharan Africa

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By

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ABSTRACT

It is customary to postulate that International Monetary Fund (IMF) agreements or arrangements in Sub-Saharan Africa (SSA) will facilitate foreign capital investments or FDI inflows from multinational corporations and or foreign investors. Through empirical observations, and using a two-stage modelling technique, this research tested and examined this hypothesis. It empirically showed that SSA countries that had IMF interventions for the period 1980 to 2015 attracted FDI inflows into their economies. The study rebutted the claim that countries with previous IMF interventions were likely to appeal to multinational corporations (MNCs) or foreign investors and thereby cause the inflow of FDI into Sub-Saharan Africa.

Catalytic Effects of IMF Agreements on foreign direct investment (FDI) inflows in Sub-Saharan Africa

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GLOSSARY OF TERMS

FDI inflows: Net Foreign Direct Investment inflows

IMF agreements or arrangements: International Monetary Fund's (IMF) supported programs or arrangements

MNCs: Multinational Corporations

SSA: Sub-Saharan Africa

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Recent macroeconomic frameworks employed by the International Monetary Fund (IMF) through its agreements predict that participating countries will recover or increase foreign direct investment (FDI) inflows (IMF, 2016). Comprising of 189 countries, the IMF seeks at the core of its being the promotion of monetary cooperation globally, stabilisation of financial markets, facilitation of trade, poverty reduction, creation of jobs or employment, fostering of economic growth and sustainability (IMF, 2016). For instance, these frameworks assume that IMF agreements help restore macroeconomic stability (Killick, 2003; Stone, 2002), address structural constraints to growth (Dicks-Mireaux, *et al.*, 2000), rebuild confidence and encourage foreign investors to invest abroad (Al-Sadiq, 2015).

The key question remains whether IMF agreements have the catalysing effect to promote FDI inflows. In this regard, there is limited empirical research conducted. A large number of studies have empirically examined the catalytic effects of IMF agreements on macroeconomic variables such as balance of payments (Khan *et al.*, 1990; Przeworski & Vreeland, 2000; Stone, 2002), inflation (Blejer *et al.*, 2002; Jensen, 2004), or macroeconomic growth (Khan *et al.*, 1990; Dicks-Mireaux *et al.*, 2000; Killick, 2003; Barro & Lee, 2005). Very recently, BalGunduz and Crystallin (2014) examined the catalytic effects of IMF agreements on emerging markets, in so far as assisting emerging economies regain access to international financial markets.

However, catalytic effects these agreements have on FDI inflows have received limited attention, with the exception of a few studies such as those conducted by as Bird and Rowland (2002,) Bird and Graham (2003), Jensen (2004), Biglaisier and DeRouen (2010), and Al-Sadiq (2015). Only one study focused on IMF agreements and FDI location in low income countries (LICs) (Al-Sadiq, 2015). There are no studies that have concentrated singularly on Sub-Saharan Africa (SSA). This is important as FDI inflows to SSA have marginally increased by 5% to \$42 billion in the recent report by the World Investment Report (UNCTAD, 2015).

Consequently, this study sought to empirically assess catalytic effects of IMF agreements or arrangements on FDI inflows in SSA. Throughout this paper, these two terms, **agreements** and **arrangements** are used interchangeably. This chapter in particular starts by presenting a problem statement in the context of the study in question. It starts by discussing the role of IMF agreements in the context of FDI location. Next, it discusses the research objectives, questions and hypotheses developed and undertaken in conducting this study. Then it discusses the purpose and significance of the study, how this study will and contribute to the theory and practice in this domain or field of study. Lastly, it ends by outlining how the rest of the paper is organized.

1.2 PROBLEM STATEMENT

1.2.1 THE ROLE OF IMF AGREEMENTS

There are three ways in which IMF agreements can facilitate FDI inflows into developing countries (SSA in particular) – first, by a sound macroeconomic framework reinforced by IMF conditionality (Blejer *et al.*, 2002); second, by improved market efficiency as a result of the agreements, and third, by improved institutional capacity, transparency and governance in the participating countries (Al-Sadiq, 2015).

Mody and Saravia (2003) emphasised that for countries where there is deterioration and minimal macroeconomic indicators, IMF agreements could lead to substantial economic gains. Brune *et al.* (2004) hypothesised that countries with IMF agreements were able to privatise their national assets compared to those not under the agreements. Al-Sadiq (2015) discovered that LICs with IMF agreements were associated with increased FDI inflows than those that were not. Consequently, this study sought to establish empirically catalytic effects that IMF agreements or arrangements have on FDI inflows in SSA.

1.3 SUB-SAHARAN AFRICA AND FDI

There has been limited or in some cases no prior studies that examined the impact or influences of IMF agreements in as far as FDI inflows into SSA is concerned. Suffice to mention that the closest study was that of Al-Sadiq (2015), which examined the impact of IMF arrangements in low-income countries (LICs). It appears there are no studies that have uniquely concentrated on SSA. As literature indicated, this is crucially vital as it has been proven that FDI inflows into Sub-Saharan Africa have marginally increased (UNCTAD, 2015). Furthermore, previous research in this domain has shown that FDI inflows typically follow those countries with expected higher returns (Al-Sadiq, 2013). This is important for SSA economies as higher capital returns will likely drive private domestic investment and consequently attract foreign direct investment inflows (Al-Sadiq, 2015).

Consequently, Sub-Saharan Africa countries were the focus of this study. This empirical study was therefore based on an unbalanced paneled data set that consisted of 41 SSA countries between 1980 and 2015 (Baltagi, 2008; World Bank, 2016).

1.3.1 FOREIGN DIRECT INVESTMENT DETERMINANTS

Lately, global FDI inflows have started to deteriorate, for instance, 2014 saw FDI inflows decline by 16% to \$1.23 trillion due to the universal macroeconomic crisis of 2008, and the heightened geopolitical risks and policy uncertainty for investors (UNCTAD, 2015). Developing economies

continue to extend their lead in global inflows. FDI inflows for developing economies peaked at \$681bn with a 2% rise. In Africa particularly, FDI inflows remained steady at \$54 billion. In SSA specifically, FDI inflows increased by 5% to \$42 billion in 2014 (UNCTAD, 2015; World Investment Report (2015)).

Why would firms want to invest overseas? Dunning (2013), postulated that multinational corporations (MNCs) and or foreign investors will typically want to move into foreign markets for various reasons: 1) to take ownership advantages of local firms, 2) if there are location advantages inducing MNCs to serve investors through foreign capital, and 3) to take advantage of internalisation. For host countries, foreign capital is a crucial element for macroeconomic advancement. They tend to attract foreign capital in order to increase capital stock, encourage technology spill overs, create jobs and collect taxes (Jensen, 2004). As highlighted by Khan *et al.*, (1990), Killick (2003), Dicks-Mireaux *et al.*, (2000), Barro and Lee (2005), FDI has become a focal point for economic development in developing countries.

Host countries with sound and robust financial systems tend to benefit more from FDI (Alfaroa *et al.*, 2004). Ndikumana and Verick (2008) also posited that FDI tends to crowd in domestic investments especially in SSA and as such, national policies must focus on harnessing complementarities between domestic and private investments. Al-Sadiq (2013) also reinforced this perspective, in that FDI stimulates private investments especially in LICs, provided that human capital is available. Consequently, how then do **IMF agreements**, by enhancing a country's economic and political fundamentals, promote foreign capital as pointed out above?

1.4 RESEARCH OBJECTIVES AND HYPOTHESIS

1.4.1 RESEARCH SCOPE

This research assessed the catalytic effects of IMF agreements on FDI inflows in Sub-Saharan Africa. As the scope of FDI location and IMF agreements evolves, so too will the nature of the catalysis effects. As such, by limiting this research on Sub-Saharan Africa, the central research question addressed was framed as, *Do IMF agreements or arrangements have catalysing effects on foreign direct investment inflows in Sub-Saharan Africa?* This research question is stated as follows:

1.4.2 RESEARCH QUESTION

What are the catalytic effects of IMF agreements or arrangements on foreign direct investment (FDI) inflows in Sub-Saharan Africa?

Given the specific focus of this research on Sub-Saharan Africa, specific research questions answered as part of this study were:

1. *What are the catalytic effects that influence Sub-Saharan African (SSA) countries to participate in IMF agreements?*
2. *What are the catalytic effects of foreign direct investment inflows that influence investment decisions of foreign investors or Multi-National Corporations (MNCs) to invest in SSA?*
3. *Do the catalytic effects of IMF agreements influence foreign direct investment inflows in SSA?*
4. *Are Sub-Saharan African countries with previous IMF interventions expected to attract more FDI inflows?*

1.4.3 RESEARCH OBJECTIVES

From these specific research questions, the primary objective of this research is to *assess empirically catalytic effects of IMF agreements on foreign direct investment inflows in Sub-Saharan Africa*. The specific objectives that formed the basis of this research were as follows:

1. To establish the catalytic effects that influence *Sub-Saharan African countries to participate in IMF agreements*.
2. To determine the catalytic effects of FDI inflows that influence investment decisions of foreign investors and or multi-national corporations to invest in *Sub-Saharan Africa*.
3. To ascertain if the catalytic effects of IMF agreements influence FDI inflows in Sub-Saharan Africa.
4. To uncover if Sub-Saharan African countries or economies with previous IMF interventions are expected to attract more FDI inflows.

1.4.4 RESEARCH HYPOTHESES

Against this backdrop and flowing from these specific research objectives, the following research hypotheses were framed:

H₁: *Catalytic effects of International Monetary Fund (IMF) agreements influence Sub-Saharan African countries to participate in IMF arrangements.*

H₂: *Catalytic effects of foreign direct investment (FDI) inflows influence investment decisions of foreign investors or Multi-National Corporations (MNCs) to invest in SSA.*

H₃: *Catalytic effects of IMF agreements influence FDI inflows in SSA.*

H₄: *Sub-Saharan African countries with previous IMF interventions are expected to attract more FDI inflows.*

1.4.5 JUSTIFICATION OF THE STUDY

To fully appreciate the overall catalytic effects of IMF agreements on FDI inflows, the reaction and cues of private investors, especially MNCs is crucial (Jensen, 2004). For SSA in particular, where countries seek international foreign capital as a strategy to foster economic development, the catalytic effects of IMF agreements and foreign capital flow develops.

Further, reactions of foreign investors to IMF agreements are expected to serve as an indicator to measure economic performance for participating countries (Jensen, 2004). More importantly, private investors can avoid those economies with a questionable macroeconomic outlook if they are aware of the association between IMF agreements and FDI inflows. Comprehending the influences and impacts induced by IMF arrangements on FDI inflows is a public policy imperative to answer for countries wanting to redress the effect of the recent economic crisis by promoting foreign capital injection into their economies (Jenson, 2004). Finally, scholars are expected to be able to build a broader understanding of the catalytic effects of IMF agreements on FDI inflows on domestic economies. This would prove highly advantageous for SSA countries that seek to attract FDI.

Notwithstanding the above, the study would contribute to already existing literature on the influences of IMF agreements on foreign capital; in particular, it would benefit those scholars interested in Sub-Saharan Africa, as no studies of this nature existed for Africa, SSA in particular. The closest study conducted in this respect examined this phenomenon in LICs as pointed out in Al-Sadiq's (2015).

1.4.6 POTENTIAL USERS OF OUTCOME OF STUDY

As discussed above, the findings of this report would be of interest to the South African government whose interest imperatives include attracting FDI inflows into the economy to foster economic development. SSA countries whose governments are recipients of the IMF loans would appreciate the outcomes of this study. Further, private investors, who need to make investment decisions on where to invest, would find the findings of this research invaluable.

As discussed above, private investors can avoid those economies with questionable macroeconomic outlook if they are aware of the association between IMF agreements and FDI inflows. Lastly, scholars would appreciate this study as they seek to broaden their understanding of catalysing effects of IMF lending and foreign capital on domestic economies.

1.5 STRUCTURE AND ORGANISATION OF THE STUDY

This report is organised as follows, firstly, a review and study of the existing body of knowledge or literature in this domain (Chapter 2) is presented, dealing and expanding specifically on IMF agreements in Africa, more specifically Sub-Saharan Africa. In this section, literature on theoretical and empirical relationships between IMF agreements and macroeconomic factors or variables is presented. Discussed in this section is also the literature on IMF agreements in developing countries, literature on IMF agreements and foreign capital, in particular foreign direct investment. A research methodology section (Chapter 3) follows from the literature review section. It details the methodology and approach of how the study was conducted. This section covers research approach and strategy, description of regression models used to analyse the data and estimation approaches. It also addresses the challenges of research reliability and validity that a study of this nature encounters. Limitations of the study are then discussed. Chapter 4 presents the research findings, analysis and discussion of this study followed by Chapter 5 and Chapter 6 which will focus on research conclusions and recommendations for future research respectively.

2 CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Protracted and non-ending as well as increasing impact of IMF arrangements in developing economies in particular has forced and encouraged scholars to study, examine and scrutinise the catalysing effects and or impact of these agreements on the macroeconomic performance of an economy or nation. Numerous studies have empirically suggested that IMF agreements improve a country's ability to stabilise the international monetary system and to improve access to stabilise financial markets (Hajivassilious, 1987; Killick *et al.*, 1990; Rodrick, 1995, Mody & Saravia, 2003; Benelli, 2003; Bird & Rowlands, 1997, 2002, 2007; Edwards, 2005; Arabaci & Ecer, 2014).

As alluded to earlier, there is limited empirical studies in as far as the impact and influence of IMF arrangements have on FDI inflows is concerned, and findings in this regard have been inconsistent and conflicting (Bird & Rowlands, 2002; Jensen, 2004; Biglaiser & DeRouen, 2010; Al-Sadiq, 2015). The following sections discuss these conflicting and inconsistent views. This chapter starts by introducing IMF agreements and their impact on macroeconomics. Next it discusses IMF agreements and their impact on FDI inflows in developing countries, primarily Sub-Saharan Africa. Thereafter, it discusses IMF agreements and the impact on foreign capital. In particular, it dives deeper into the discussion of IMF agreements on foreign direct investments (FDI) which forms the basis of this study.

This chapter is organised in the following manner, firstly an introduction though brief of the International Monetary Fund (IMF) and its role is provided, this is followed by a quick introduction on IMF agreements, what they are and the purpose they serve. Following this section is some literature on FDI location and its determinants. Then the next section focuses on literature on IMF agreements and macro-economic variables. This section covers literature on balance of payments, economic growth, inflation, and fiscal deficit to GDP ratio. Following this section is a discussion of IMF agreements in developing countries. Finally, it ends with literature on IMF agreements and foreign capital, specifically FDI inflows. It then concludes with a hypothesis of how the research question was built based on the literature review and the gaps identified.

2.1.1 INTERNATIONAL MONETARY FUND AND ITS ROLE

What then is the role of the World Bank in all of these? As enumerated by various scholars previously, but notably of late by Jensen (2004), it is an institution with a primary purpose of channeling project related financing and other forms of economic assistance for countries in developing nations that struggle to attract foreign capital through market-related mechanics. On the contrary, the International Monetary Fund, envisioned originally to help countries restore international monetary system stability (IMF, 2016). Primarily, the International Monetary Fund plays a key role in that it advises member countries on issues of financial and economic nature,

that are likely to promote and enhance stability, reducing vulnerable situations, and further encouraging sustainable growth by promoting highest standards of living (IMF, 2016). Consequently, the IMF's primary goal and or objective is embedded on safeguarding and stabilising the international monetary system. In other words, it ensures that macroeconomic dynamics of a country are stable, be it international payments, balance of payments and or exchange rates (IMF, 2016a).

2.1.2 IMF AGREEMENTS, WHAT ARE THEY?

As discussed above, a stable and strong monetary system is at core and a central focal objective of the IMF. The question then is, how does the IMF achieve this? Answering this question is the focus of this section. Fundamentally, if a country encounters a problem with its Balance of Payments (BOP) account; it then approaches the IMF for assistance. This in essence the primary requirement for the IMF to be involved (Bird, 2001). Once this condition is satisfied, it is then translated into an agreement of policies that are negotiated between the country and the IMF which both parties then sign in the letter of intent (Bird, 2001). As alluded to earlier, IMF agreements are meant to strengthen the BOP, but they also provide the resources with which the funds under the agreement can be repaid which can then be used to provide support for other countries (Bird, 2001; IMF, 2016).

In addition, besides assisting countries to deal with macroeconomic challenges (balance of payments, exchange rates) highlighted above, the fund also assists countries in their efforts to rebuild their international reserves, bringing stability to their currencies. The fund also assists countries to continue to pay for the imports, thereby restoring conditions for strong economic growth, while simultaneously assisting struggling economies to implement corrective economic policies that seek to address the underlying problems (IMF, 2016). Crucially, the IMF does not operate like development banks, in other words, it does not lend to member countries for specific projects (IMF, 2016).

2.1.3 FDI LOCATION AND ITS DETERMINANTS

2.1.3.1 DEFINITION OF FDI

According to the OECD (2008; 2013), a key driver of FDI is premised on economic integration and cohesion that focuses on stabilising, promoting and enhancing society's well-being, be it financial, economic, or otherwise. Further, local enterprise development and strengthening of the competitiveness of both the host and the foreign investors can be achieved if FDI inflows are entrenched thoroughly in the national economic policy documents of a country (OECD, 2008; 2013). More specifically, the fundamental determinants of FDI include transferring of technological capabilities and promotion of services and products between nations (OECD, 2008).

Lastly, FDI has a positive effect in developing international trade and it is also a great source of capital for the host nations (OECD, 2008). So, if FDI is this important, what is it?

The universal definition of FDI is that it involves investments, participation and foreign capital injection into firms in another country of origin other than that of the investor, and the investments are typically of long term in nature (UNCTAD, 2012). The Financial Times (FT) simplified this definition, and defined FDI as a form of investment where one country injects funds into another's and establishes operations that may sometime involve acquiring assets or buying a stake which in most instances will be with other businesses in the host country rather than governments (FT, 2016). Further, FDI focuses on capital, management, technology and organisational skills that are complementary to each other (FT, 2016).

2.1.3.2 FDI DETERMINANTS

So why would firms want to invest overseas? Dunning (2013), postulated that multinational corporations (MNCs) will typically want to move into foreign markets for various reasons: 1) to take ownership advantages of local firms, 2) if there are location advantages inducing MNCs to serve investors through foreign capital, and 3) to take advantage of internalisation. For host countries, foreign capital is a crucial element for macroeconomic advancement. They tend to attract foreign capital in order to increase capital stock, encourage technology spill overs, create jobs and collect taxes (Jensen, 2004). As highlighted by Khan *et al.*, (1990), Killick (2003), Dicks-Mireaux *et al.*, (2000), and Barro and Lee (2005), FDI has become a focal point for economic development in developing countries.

Host countries with sound and robust financial systems tend to benefit more from FDI (Alfaroa *et al.*, 2004). Ndikumana and Verick (2008) also posited that FDI tends to crowd in domestic investments especially in SSA, and as such national policies must focus on harnessing complementarities between domestic and private investments. Al-Sadiq (2013) endorsed this perspective, in that FDI stimulates private investments especially in LICs provided that human Capital is available. Consequently, how do **IMF agreements**, by enhancing a country's economic and political fundamentals, promote foreign capital as pointed out above?

Accordingly, the next section discusses IMF agreements and the relationships they have on macroeconomic variables, which are balance of payments, economic growth, inflation, and fiscal deficit to GDP ratio.

2.2 IMF AGREEMENTS AND MACROECONOMIC VARIABLES

2.2.1 IMF AGREEMENTS AND THE BALANCE OF PAYMENTS

Typically, one would expect a positive relationship on the effects of macro-economic variables of a country with IMF arrangements, but this generally is not the case. In his study of the influences of IMF agreements on FDI inflows, Jensen (2004) highlighted that the increased conditions of domestic economies coupled with the increased effects of IMF lending to developing countries, researchers have begun to show interest on what possibly could be the impact and or influences of IMF agreements, especially on macroeconomic variables. There are limited and or no evidence of studies that indicate that IMF plays a role in stabilising economies that are in crisis (Jenson, 2004).

Przeworski and Vreeland (2000) supported this view. They discovered that countries typically enter into the IMF agreements to ease foreign reserves pressure crisis. Some countries however, they argued, enter into these agreements to shield themselves from high political costs associated with adjustment programs. Their study indicated that countries actually tend to grow much faster economically once they leave the participation, but not faster than they would have if they had stayed participative on the IMF agreement.

On the other hand, Haque and Khan (1998) revealed a positive correlation between International Monetary Fund agreements and its impact on the balance of payments. Their studies indicated that IMF agreements generally are successful in stabilising economies. Stone (2001), later supported this discovery, especially if larger samples and sophisticated methods were employed. IMF arrangements positively impacted balance of payments by assuming quicker growth recovery through attracting foreign investment.

Contrary to Haque and Khan's (1998) findings, Przeworski and Vreeland (2000), established that IMF agreements had no impact on the balance of payments. Further, Connors' (1979) study was inconclusive in this regard. In other words, countries that participated in IMF agreements did not see any improvements in the balance of payments. Connors (1979) established that the agreements were instrumental in returning a country to a favourable balance of payments position but not significant in improving the prior situation.

2.2.2 IMF AGREEMENTS AND ECONOMIC GROWTH

What is even unclear is what the impact IMF agreements have on economic growth is. For instance, Dicks-Mireaux *et al.* (2000) and Killick (2003) found that GDP and economic growth actually correlated positively. Conversely, Przeworski and Vreeland (2000), Vreeland (2003), and Barro

and Lee (2005), disagreed with this finding. They found that IMF agreements showed low levels of association with the economic growth of a country.

Interestingly enough, IMF's own research found that IMF agreements could have negative effects on foreign Capital (Khan *et al.*, 1990). Consequently, scholars have hypothesised that IMF agreements exhibit a negative association on economic growth (Jenson, 2004). According to Jenson (2004), countries that signed IMF agreements had attracted less international capital inflows than countries that did not sign IMF agreements.

This begs the question, why do IMF agreements have low levels of positive associations on economic growth? Scholars have theorised and put forward a compelling argument and the reason for this could be that IMF agreements come with strict policy prescriptions, also known as IMF conditionality. This is discussed briefly in the next section.

2.2.2.1 IMF CONDITIONALITY ON ECONOMIC GROWTH

In its recent published factsheet on conditionality, the IMF summarised its view as follows:

“When a country borrows from the IMF, its government agrees to adjust its economic policies to overcome the problems that led it to seek financial aid from the international community. These loan conditions also serve to ensure that the country will be able to repay the Fund so that the resources can be made available to other members in need. Lending reforms approved in 2009 streamlined IMF conditionality in order to promote national ownership of strong and effective policies”. (IMF, 2015, p1)

Mayer and Mourmouras (2008), postulated that IMF loans are typically paid out in tranches conditional on the country being able to implement a programme of macroeconomic adjustments and policies as entered into with the IMF. This is important for the international community for assurance that the recipients will adopt adequate reforms to redress their economic challenges and repay their debts on scheduled time (IMF, 2015).

Various scholars (Sidell, 1988; Killick, 1995; Thacker, 1999; Barro & Lee, 2001; Vreeland 2002, 2003; Oatley & Yackee, 2004; and Dreher & Jensen, 2007) found inconclusive evidence that IMF imposed conditions that positively influence macroeconomic performance of economies under the IMF agreements. Specifically, Jensen (2004) attributed this amongst others to the fact that signing IMF agreements was costly for domestic governments and that the IMF imposed conditions may result in political instability.

Further, IMF agreements were negatively correlated with a decline in national income for participating labour in these economies. Another possibility for this negative relationship was emphasised numerous (Thacker, 1999; Barro & Lee, 2001; Oatley & Yackee, 2004; Dreher & Jensen; 2007). More specifically, IMF imposed conditions tended to have long run economic costs, as their sole purpose was mainly to relieve crisis and long-term macroeconomic performance.

Despite the negative relationship described above, IMF lending stabilised economies and provided citizens an enhanced economic climate (Jensen, 2004). Sidell (1998) also discovered that IMF

agreements helped existing governments maintain their current offices. Lastly, there is no conclusive evidence to suggest that IMF agreements are politically destabilising (Jensen, 2004). There are no studies reported to date that recorded a negative association between IMF imposed conditions and macroeconomic performance of a country.

2.2.2.2 IMF PARTICIPATION

With regards to IMF agreements and a country participating, Vreeland (2003) found that political regimes did not influence the continuation of IMF agreements, but did affect the participation. This phenomenon could only be explained by economic factors as to why a country should continue to participate on the IMF programme, Vreeland (2003) postulated. Jensen (2004) agreed with this view and concluded that there was a negative association between *political regime* and *existence of democracy* as factors influencing a country's participation or to remain on the IMF agreement.

Contrary, Jensen (2004) posited that the rate at which an economy grows, significantly determines the IMF participation of countries that struggle economically, stand a better chance to obtain funding, provided that they have a sound macroeconomic framework coupled with stable political climate. Lastly, Biglaiser and DeRouen (2010) examined if countries under different IMF Agreements received more FDI inflows than countries not on such arrangements. They found that while IMF agreements positively influenced FDI inflows, specific agreements yielded different results (Biglaiser & DeRouen, 2010).

In recent studies conducted by Mumssen *et al.* (2013), they found that for low income countries, IMF agreements boosted macroeconomic variables and boosted fiscal resilience. Further, they found that augmenting existing IMF agreements with short-term arrangements or emergency facilities yielded positive outcomes. Can this result withstand the test of time if these economies were experiencing instability or suffered some sort of exogenous shock? Though not the focus of this research, there is limited empirical evidence in this regard to support otherwise. *Lastly, does the size of the IMF agreements affect the outcomes of macroeconomic variables discussed above?* This research question is not in the scope of this research, and no literature exists that supports or negates this hypothesis.

2.2.3 IMF AGREEMENTS AND INFLATION

According to Connors (1979) when studies of this nature were first conducted, he found that IMF agreements were generally designed to reduce inflation in countries where inflation had been a problem. He concluded however, that there was no significant difference in inflation rates before and after the IMF agreements were implemented. The most recent study by Dicks-Mireaux *et al.* (2000) supported this finding. It found statistical significance in inflation rates after IMF arrangements were entered into by participating countries.

2.2.4 IMF AGREEMENTS AND FISCAL DEFICIT TO GDP RATIO

Typically, IMF agreements necessitated a reduction in the fiscal deficit of an economy either through the reduction of expenditures or the increase in revenue as articulated by Connors (1979). Though his studies were conducted more than three decades ago, the results yielded a no positive association when it came to IMF agreements and fiscal deficit to GDP ratio (Connors, 1979). Most recent studies by Dicks-Mireaux *et al.* (2000) found noticeable statistical difference in the fiscal deficit to GDP ratio before and after IMF arrangements.

Studies conducted on the impact of these agreements and the impact they have had on the economy, have largely been on the above discussed macroeconomic variables, that is balance of payments, economic growth, inflation and fiscal deficit ratio to GDP. Critically important are the reactions of how multinational corporations (MNCs) or private investors react to reforms initiated under IMF agreements. The next section discusses this in detail.

2.3 IMF AGREEMENTS IN DEVELOPING COUNTRIES

Studies on IMF agreements and FDI inflows have received limited attention, with the exception of a few studies such as those of Bird and Rowland (2002), Jensen, (2004), Biglaiser and DeRouen (2010), and Al-Sadiq (2015). Only one study focused on IMF agreements and FDI location in low-income countries (Al-Sadiq, 2015). There are no studies that have concentrated singularly on Sub-Saharan Africa. This is important as inflows to SSA have marginally increased by 5% to \$42 billion in the recent World Investment Report (UNCTAD, 2015). This section dives deeper into previous literature conducted of the influences of IMF arrangements in the context of developing economies, SSA more specifically.

Though the intentions were valid when IMF agreements were conceptualised, that is, to stabilise economies, encourage privatisation and free market development, critics have argued that IMF arrangements have paid less with respect to the social development dimension (Heidhues, 2011). Additionally, these agreements were not set up efficiently to promote market and institutional development in Africa (Heidhues, 2011).

Herbst (1990) argued that the structural dimensional element of IMF agreements on the African continent in particular, tended to impose limits on politicians to direct resources to be used for the right cause. Dollar and Svenson (2000) used a sample of 200 IMF programs to understand causes of failure and found that most of these agreements failed because of the political-economy issues within the country that wished to reform. They concluded that a few political-economy variables were able to predict the success of IMF agreements most of the times. Such variables included amongst others ethnic fractionalisation, political instability, democratically elected, time in power, macro and fiscal conditions, sectoral conditions and trade conditions (Dollar & Svenson, 2000).

Geo-Jaja and Mangum (2001) have also postulated that IMF agreements in Africa in particular were attributed to poor resource allocation and inadvertent elimination of good policies. They

argued that economic development in Africa is still very much depended on human resource development.

London *et al.* (2012) hypothesised that though IMF agreements were intended to solve gaps in balance of payments by ensuring that countries highly in debt instituted a series of reforms in return of the loans, these reforms are known to negatively affect the devaluing of currencies and reduced government spending. They also suggested that these reforms involved liberalising trade and privatising government assets which may not always be favourable (London *et al.*, 2012).

On the contrary, studies by London *et al.* (2012) found that higher amounts of IMF agreements corresponded with higher infant mortality rates in Sub-Saharan Africa countries. So why is this the case? In this study, London *et al.* (2012), maintained that IMF required indebted nations to liberalise trade, exacerbate debt repayment and limited economic development.

Ismi (2004) on the other hand, studied in detail the effects of IMF agreements in Africa. He found a series of adverse effects as a result of IMF agreements. This included among others, slower growth, increased poverty, low human development index and increased debt burdens amongst others.

2.4 IMF AGREEMENTS AND FOREIGN CAPITAL

Previous literature that assessed influences of IMF agreements largely looked at balance of payments (Khan *et al.*, 1990; Przeworski & Vreeland, 2000; Stone, 2002;), inflation (Dicks-Mireaux *et al.*, 2000; Blejer *et al.*, 2002; Jensen, 2004), macroeconomic growth (Khan *et al.*, 1990; Dicks-Mireaux *et al.*, 2000; Killick, 2003; Barro & Lee, 2005), and fiscal deficit to GDP ratio (Connors, 1979; Dicks-Mireaux *et al.*, 2000; Blejer *et al.*, 2002). Private investors as well as MNCs are also impacted by the reforms initiated under the auspices of IMF agreements.

For foreign investors, FDI inflows has many potential benefits, including access to markets (Jensen, 2004, Dunning, 2013); diversification, low labour cost, extraction and processing of natural resources (Jensen, 2004). Notwithstanding these benefits, MNCs also face high levels of risks as they venture into new markets (Biglaiser & DeRouen, 2010). Consequently, countries that can create a market friendly environment tend to attract higher levels of FDI (Li & Resnick, 2003; Jensen, 2004).

2.5 IMF AGREEMENTS AND FDI INFLOWS

Few studies have sought to examine impacts associated with IMF agreements, particularly on foreign capital injections. Hajivassiliou (1987) and Faini *et al.* (1991) found no correlation on the impact of IMF agreements when it came to attracting FDI. However, studies by Bird (1995) and Jensen (2004) concluded otherwise. They established that IMF agreements did not influence the direction of FDI inflows positively, rather negatively.

Specifically, countries that relied on the IMF during economic crises for support inhibited their chances to secure IMF lending (Jensen, 2004). Bird (1995, 2013) discovered that less developed countries tended to seek IMF lending once their foreign reserves were low resulting in deficits for their balance of payments, and consequently increased foreign debt (Bird, 1995, 2013). On the other hand, Moody and Saravia (2003), Brune *et al.*, (2004) and recently Al-Sadiq (2015) showed a positive association between IMF agreements and FDI inflows.

Specifically, Al-Sadiq's study (2015) indicated that LICs under IMF agreements attracted significant FDI inflows for the period studied. Countries that participated in IMF agreements were able to increase FDI inflows than those countries that did not participate in IMF arrangements (Al-Sadiq, 2015).

2.6 SUMMARY

The literature on IMF agreements in as far as FDI inflows in SSA is concerned was examined to review if any relationship between these two concepts exists. A brief background of the IMF and the role of IMF agreements was presented. Further, an examination of the determinants of each of these concepts was presented, highlighting the interplay between the role of IMF agreements and the macroeconomic variables. Focus then shifted on to FDI location and its determinants, and the associated impact on macro-economic variables. Table 2-1 below summarises the key concepts covered in this section for the two main variables that form the basis of this study, IMF agreements and foreign direct investment (FDI) inflows.

Table 2-1: Literature Review Consistency Matrix

Dependent Variables						
Independent Variables	IMF Agreements			FDI Inflows		
	Positive	Negative	No Effect / Inconclusive	Positive	Negative	No Effects / Inconclusive
Current Account Balance	Khan (1990), Stone (2002), Bird and Graham (2003)	Przeworski and Vreeland (2000)	Connors (1979)	Arabi (2014)		Siddiqui <i>et al.</i> (2013)
GDP per Capita	Dick-Mireaut <i>et al.</i> (2000)	Khan (1990)		Chowdhury and Mavrotas (2005), Kok and Ersoy (2009)	Edwards (1990)	
Inflation		Khan (1990), Vreeland (2003), Jenson (2004)	Dicks-Mireaux <i>et al.</i> (2000)	Masca and Demirhan (2008), Siddiqui (2008), Niazi <i>et al.</i> (2011), Sayek (2013), Narendra (2014)		
Total Reserves	Bird and Graham (2003)			Popov and Polterovich (2002), Khan and Khachoo (2012)		
GDP Growth	Killick (1995), Dicks-Mireuax, <i>et al.</i> (2000)	Przeworski and Vreeland (2000), Barro and Lee (2001), Vreeland (2003), Jenson (2004)	Khan (1990)	Jensen (2004), Narendra (2014)	Hansen and Rand (2006)	Artige and Nicolini (2005), Narendra (2014)
Trade		Bird and Graham (2003)		Jensen (2004), Narendra (2014)		
IMF Participation / Agreements				Bird and Rowland (2002), Mody and Saravia (2003), Brune <i>et al.</i> (2004), Biglasier and DeRouen (2010), Al-Sadiq (2015)	Faini <i>et al.</i> (1991), Hajivassiliou (1987), Mody and Saravia (2003), Jenson (2004), Ismi (2004)	Hajivassiliou (1987), Faini <i>et al.</i> (1991)
Polity (Good Governance Factors)		Bird and Graham (2003), Biglaiser and DeRouen, 2010				
IMF Conditionality	Blejer (2002)	Sidell (1988), Jenson (2004)				
Source: Researcher own analysis						

Consequently, and in order to progress the development of research in understanding these areas, this research specifically examined the interplay in the context of Sub-Saharan Africa in so far as IMF agreements may or may not impact and or influence FDI inflows. How this examination was conducted, together with the underlying theoretical rationale, is the focus of the following chapter.

3 CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

The main data sources employed by the study are presented in this chapter, alongside the details as it relates to the analysis and presentation of the data (Section 3.5). Section 3.6 outlines how aspects of data validity and reliability of this study were dealt with. Lastly, limitations of this study are presented (Section 3.7).

This section deals with the research approach adopted, outlining the underlying paradigms and perspectives from which this research was conducted. A quantitative study approach was central to this study and provided details of the overall research design.

3.2 QUANTITATIVE RESEARCH DESIGN

Empirical analysis of this study used **unbalanced fixed panel data** (Wooldridge, 2002; Baltagi, 2005, Greene, 2008; Baltagi, 2008) of Sub-Saharan African countries with IMF agreements over the period 1980 to 2015. It is referred to as fixed panel data in that the same set of entities (countries) are observed over each period (Greene, 2007). Unbalanced or incomplete data panels are where data or observations are missing for certain countries in the sample (Baltagi, 2005). This study used the panel data model to observe group or individual-effects as well as time-effects in order to account for any possible heterogeneity, e.g. political stability that may not have been observed (Park, 2011, p7).

3.2.1 ADVANTAGES OF PANEL DATA

Baltagi (2008) defined panel data as data sets consisting of multiple observations in a sample unit of analysis. Panel data is typically generated by pooling cross-sectional units or entities and observing them over time. In most instances panel data is time-series in nature. Some of the advantages of using this type of data are discussed below.

3.2.1.1 EFFICIENCY OF PARAMETER ESTIMATORS

Estimators that use panel data sets generally are a lot more accurate than those used in other sets of data because of the typically larger sizes than cross-sectional data (Vreeland, 2003; Baltagi, 2008). To allow for efficiency in estimating parameters, pooling panel data is a great starting point for this type of analysis.

3.2.1.2 IDENTIFICATION OF ESTIMATORS

Baltagi (2008), highlighted succinctly that panel data controls for individual heterogeneity, in that it allows for easier identification rather than mere estimation of the effects that may possibly be only detectable in the time-series or cross-sectional data. Despite these advantages, panel data has its own disadvantages.

3.2.2 DISADVANTAGES: PANEL DATA

Some drawbacks of panel data studies include collection issues in terms of sampling design and coverage and cross-country dependency in the case where correlation between countries is required (Baltagi, 2008). Other challenges may be experienced during design and data collection phases. It may also be challenging to address selectivity problems such as self-selectivity, non-response and cross-section independence (Baltagi, 2008).

The next section discusses regression models used for estimating panel data studies.

3.3 REGRESSION MODELS: PANEL DATA

As highlighted earlier, a number of techniques are available to estimate panel data studies. These models exist to examine individual or group-specific time effects (Park, 2011). Three regression model techniques to empirically study the effects of the controlled variables that varied over time and with the potential to affect IMF participation and FDI inflows into SSA were employed (Baltagi, 2005; Allison, 2009; Williams, 2016). These were Ordinary Least Squares with Panel Corrected Standard Errors (OLS-PCSE), Random Effects, and Fixed Effects. These are discussed in detail in this section.

3.3.1 POOLING WITH OLS (PCSE)

In the regression equation represented below,

$$y_{i,t} = \alpha + X'_{i,t}\beta + \varepsilon_{i,t}, \text{ where } u_i = 0$$

OLS method will produce consistent and efficient parameter estimates if u_i does not exist, i.e. if $u_i = 0$

Greene (2007) cited in Park (2011, p7) highlighted five core assumptions that exist for Pooled OLS, and presented some of the challenges if one of them were violated:

- a) **Linearity** – where a linear function model consisting of the predictor or explanatory variables and the error often referred to as the disturbance term, the predicted or dependent variable is formulated.

- b) **Exogeneity** – disturbances (errors) are not correlated with one another.
- c) **Homoscedasticity** – the errors have the same variance and are not correlated with one another, a phenomenon also referred to as non-autocorrelation.
- d) **Non-Stochastic** – where observations are fixed and no traces of measurement errors are traceable.
- e) **Full rank** or *multicollinearity* in that among the independent variables, there is no exact relationship.

The challenge presented by the Pooled OLS model is that if u_i (individual effects) is not zero, assumptions a) and b) if not fully taken into account by the predictor variables may be influenced, further exacerbating the randomness of the estimators. As such the Pooled Ordinary Least Square estimators are biased. Consequently, and to deal these challenges, panelled regression techniques are often recommended (Park, 2011).

3.3.1.1 POOLED OLS-PCSE

In OLS-PCSE modelling technique, observations are pooled, and coefficients of the regressors are then estimated using ordinary least squares (Greene, 2010). In most instances however, the error variances for the different cross-section can be expected. Take for example as Greene (2010) noted, that certain variations may be expected for some variables in the model. Moreover, Greene (2010) continued and argued that it may be realistic to expect contemporaneous error correlations which may be cross-sectional, resulting consequently in inconsistent cross-sectional heteroscedasticity OLS standard errors. To overcome this cross-sectional heteroscedasticity, PCSE modelling was recommended (Beck and Katz, 1995).

In this model, the parameters are estimated by either OLS or Prais–Winsten regression (Beck & Katz, 1995). In STATA, (a statistical software used for running the panel data for this study), for the pooled OLS regressions with panel corrected standard errors, the *xtpcse* command was used.

A major strength of why panel data is important lies fundamentally in the differences between FE and RE models which is explained in the role of dummy variables (Baltagi, 2008; Park, 2011). These differences are expanded below.

3.3.1.2 FIXED EFFECTS (FE)

To ensure that coefficients of the FE models do not result in biased results because of possible omission of time-invariant variables whose values may not change across time (Kohler, 2012; William, 2015), FE models are often used.

FE models will partial out the effects of time-invariant variables with effects that are time-invariant in nature (Williams, 2016). If focusing on a specific set of a number of countries (entities), the FE model is often appropriate approach to employ. The regression model equation for FE is represented below (Williams, 2016):

$$Y_{i,t} = \alpha + X'_{i,t}\beta + u_{i,t}$$

Where:

- α_i : the intercept for each country for n country-specific intercepts, where $(i=1 \dots n)$
- Y_{it} : dependent variable, i = country and t = time.
- X'_{it} : one independent variable
- β : coefficient of the independent variable
- u_{it} : error term (between-entity error)

In this model, an assumption is made that the error term μ_i is fixed, independent and identically distributed, that is, **IID** $(0, \sigma^2)$.

Next, the focus shifts to how the FE null hypothesis was formulated is discussed.

3.3.1.2.1 THE NULL HYPOTHESIS: FIXED EFFECTS MODEL

For FE model, all dummy variables except for one are zero for the null hypothesis. This is illustrated as follows:

H₀: $\mu_1 = \dots = \mu_{n-1} = 0$

H_a: At least one of the dummy variables is not equal to zero.

An **F test** which uses the loss on goodness-of-fit, was used to test this hypothesis. Whilst it focused on contrasting the robust model with the efficient model (pooled OLS), it examined the extent to which the sum of squared errors (**SSE**) and the coefficient of determination (**R-Squared**) changed, also referred to as the goodness of fit (Baltagi, 2008).

The null hypothesis is rejected if u_i is not equal to zero, in that case, the FE model is preferred over the RE.

Consequently, FE model is the efficient estimator of the regression model, also known as the pooled OLS. The FE model used *xtreg* with *fe* command in STATA (Torres-Reyna, 2007).

3.3.1.3 RANDOM EFFECTS (RE)

The Random Effects model, contrary to the FE model, assumes random variation across entities in the model, and thus the parameters are uncorrelated (Torres-Reyna, 2007; Baltagi, 2008). Greene (2010), had argued that key distinction between the RE and FE models lied in the way the unobserved individual effects associated with the model's regressors.

Use of RE models is common especially in instances where differences across entities have some influence over the dependent variables (Torres-Reyna, 2007; Park, 2011). Lastly, RE models allow for inclusion of the time invariant variables (for instance, region (SSA)), while the intercept is used

in the FE models to absorb these variables. The regression model for Fixed Effects, is represented as follows (Torres-Ryan, 2007; Park, 2011):

$$Y_{i,t} = \alpha + X'_{i,t}\beta + u_{i,t} + \varepsilon_{i,t} \text{ (Within-entity error)}$$

No correlation is observable in the entity's error term and the predictors in the RE model, thus variables that are time-invariant in nature can be used as independent variables. Further, in RE models it is crucial to specify what may or may not influence the individual characteristics of the predictor variables. Torres-Reyna (2007) noted that the challenge presented with these approaches are that some of variables may not be available which may lead to a bias referred to as omitted variable bias in the model. The good thing though is that it allows for generalization and inferences beyond what is used by the sample in the model. RE models use the *xtreg* with *re* command in STATA (Torres-Reyna, 2007).

3.3.1.3.1 THE NULL HYPOTHESIS: RANDOM EFFECTS MODEL

Using the LM test, also known as the Lagrange Multiplier, RE model examines if entities specific variance components are zero (Breusch and Pagan, 1980; Allison, 2009; Park, 2011). The null hypothesis for RE is therefore stated as follows:

$$H_0: \sigma^2 = 0$$

$$H_a: \sigma^2 \neq 0$$

The Lagrange Multiplier (LM) statistic with a one degree of freedom is a χ^2 distribution and the null hypothesis is rejected if the panel data signifies significantly a random effect. Consequently, RE models are better at dealing better with heterogeneity if compared to pooled OLS models (Park, 2011; Allison, 2009).

3.3.2 FIXED OR RANDOM EFFECTS

To test which effect (random or fixed) was more relevant and significant for the selection (IMF participation and outcome (FDI inflows) regression models, a Hausman test was conducted. It tests and compares presence or lack of individual effects between FE and RE models (Wooldridge, 2002; Greene, 2010).

In essence, the Hausman specification tests whether u_i (unique errors) is correlated with the regressors. RE model is favoured over FE model if the null is not rejected (Torres-Reyna, 2007; Park, 2011). Similarly, if there is no correlation, that is, if the null is rejected, FE model is preferred over RE.

The next section discusses the empirical framework underpinning this study.

3.4 EMPIRICAL FRAMEWORK

The focal point of this research was to empirically examine catalytic effects or consequences of IMF arrangements on FDI inflows in SSA, it sought to unravel in essence the impacts and influences IMF arrangements have on foreign direct investment inflows. Chwiero (2005) established that it is not a random event to participate in an IMF agreement. This research also noted the presence of selection bias or effects especially when it came to using IMF data sources (Vreeland, 2003; Jenson, 2004; Edwards, 2005). In this instance, selection effects or biases were described as biasness towards participation or non-participation in IMF agreements. In particular, some countries may have participated in IMF agreements as a result of the financial encounters that they may have experienced due to balance of payments challenges. This was discussed at length in earlier pages of this report (Chapter 2).

Jenson (2004) emphasized that standard ordinary least squares (OLS) by itself could not depict precisely the catalysing influences of IMF agreements on foreign direct investment inflows, more specifically that IMF intervention is only sought during periods of economic and financial predicaments. That is to say, if conditions that are financial in nature selectively exclude countries from receiving FDI inflows in SSA, then one could say that the traditional one stage modelling is biased and therefore it is highly likely to attribute the FDI inflows to the IMF as opposed to other attributes that may have led to participation in the IMF agreement in the first place (Jenson 2004).

This study employed the technique of Jenson (2004) and Vreeland (2003) in using the two-stage modelling technique to estimate the selection equation, that is, **IMF participation**. Previous studies evidenced strongly selection effects when it came to IMF participation (Jenson, 2004). In particular, these studies found that higher debt, lower foreign exchange reserves, slow economic growth, and previous IMF participation, encouraged countries to participate in IMF arrangement programs (Jenson, 2004).

Consequently, this study employed the OLS-PCSE (Beck & Katz, 1995), Fixed Effects and Random Effects models recommended by Baltagi (2005, 2008; Greene, 2010; Park, 2011), and probed the catalytic effects of IMF arrangements on FDI inflows in SSA.

In the two-stage model approach used in this study, stage one sought to estimate **IMF participation**. In other words, the selection equation to estimate endogenously the propensity of a country's participation in an IMF arrangement. Stage two focused on using the endogenous variable (IMF participation) above to estimate the dependent variable, **FDI inflows**. As Jenson (2004) illustrated, inclusion of endogenous variable in determining FDI inflows in the second equation (outcome equation) illuminated the effects of IMF participation that signaled multinational corporations or foreign investors to invest or direct FDI inflows into SSA. It was expected that the selection and outcome equation would yield different results, in so far as the differences that exist between the objectives of the IMF and those of multinational corporations

(MNCs). Consequently, catalysing effects of the selection and outcome regression models were expected to be different or to vary accordingly.

Consequently, the two-stage modelling technique is deliberated below (Madalla, 1983; Vreeland, 2003; Jensen, 2004).

3.4.1.1 SELECTION EQUATION: IMF PARTICIPATION

The IMF participation variable measures in a particular year if a country participated in any IMF arrangement or received assistance in funding from the IMF. Vreeland (2003) constructed this variable and it provided a dichotomous measure of SSA countries that participated or received IMF agreements for the period 1980 to 2015. As highlighted earlier, the study did not seek to draw any distinction on the nature and categories of International Monetary Fund arrangements that countries participated in.

$$IMF\ Participation = \alpha + \beta_i(Controls) + \varepsilon \dots \dots \dots (1)$$

Or rewritten as:

IMF Participation

$$= \alpha + \beta_1 (Budget\ Balance)_{i,t-1} + \beta_2 \left(\frac{GDP}{CAPITA} \right)_{i,t-1} + \beta_3 (Inflation)_{i,t-1} \\ + \beta_4 (Total\ Reserves)_{i,t-1} + \varepsilon_{i,t} \dots \dots \dots (1)$$

IMF = 1 if IMF > 0 and 0 otherwise.

This equation allowed for the derivation of FDI inflows by estimating IMF participation (Biglaiser & DeRouen, 2007). The dependent variable is **IMF participation**. All other independent variables were lagged one year as past participation in IMF arrangements was deemed to be the robust predictor of current participation. Further, it was assumed that countries that are currently under an IMF agreement would likely continue as their conditions may not yet have changed. In other words, circumstances that forced these countries to seek IMF assistance in the first place may still be relevant. Further, Vreeland (2003) argued that getting into an IMF agreement entailed sovereignty costs for the country in question. As such by agreeing to participate in an IMF agreement implied that the country agreed to be bound by certain IMF conditions, and therefore the country is now constrained from a macroeconomic policy point of view (Vreeland, 2003).

Control variables that were deemed to influence IMF participation included *Current Account Balance*, *GDP per Capita*, *Total Reserves* and *Inflation* (Jensen, 2004; Biglaiser & DeRouen, 2007).

The next section briefly describes how the null hypothesis for the selection equation was formulated.

3.4.1.1.1 NULL HYPOTHESIS: SELECTION EQUATION (IMF PARTICIPATION)

H₀: $\beta_i = 0$ Standardised coefficients in the regression equation model are zero. That is, no relationship exists between the coefficients of the independent variable (GDP Per Capita, Current Account Balance, Inflation and Total Reserves) and the dependent variable, IMF Participation.

H_a: $\beta_i \neq 0$ Relationship exists between the coefficients of the independent variables; therefore, the regression model is satisfactorily.

A statistical significance level (α) of 0.05 was used in the study. The null was rejected provided the p-value was less than α , and accordingly the alternative was favoured.

3.4.1.2 OUTCOME EQUATION: NET FDI INFLOWS

As emphasized above and to take care of any selection biases, the study capitalised empirically on the methods recommended by various authors (Madalla, 1983; Przeworski *et al.*, 2000; Vreeland, 2003). OLS-PCSE, RE, and FE models were used with full observability to allow for inclusion of IMF participation to determine FDI inflows. This is represented as per below:

$$Net\ FDI\ Inflows_{i,t} = \alpha + \beta_{ij}(IMF)_{i,t-1} + \beta_k(Controls)_{i,t-1} + \varepsilon_{i,t} \dots \dots \dots (2)$$

This regression model can also be written as per below:

$$\begin{aligned} \left(\frac{Net\ FDI\ inflows}{GDP} \right)_{i,t} &= \alpha + \beta_1(GDP\ Growth)_{i,t-1} + \beta_2(Trade)_{i,t-1} \\ &+ \beta_3(Current\ Account\ Balance)_{i,t-1} + \beta_4 \left(\frac{GDP}{Capita} \right)_{i,t-1} + \beta_5 Inflation_{i,t-1} \\ &+ \beta_6 Total\ Reserves_{i,t-1} + \beta_7 IMF\ Participation_{i,t-1} + \varepsilon_{i,t} \dots \dots \dots (2) \end{aligned}$$

The next section briefly describes how the null hypothesis for the selection equation was formulated.

3.4.1.2.1 NULL HYPOTHESIS: SELECTION EQUATION (FDI INFLOWS)

H₀: $\beta_i = 0$ Standardised coefficients in the regression equation model are zero. That is, no relationship exists between the coefficients of the independent variables (GDP Growth, Trade, Current Account Balance, GDP per Capita, Inflation, Total Reserves, and IMF Participation) and the dependent variable, FDI Inflows.

H_a: $\beta_i \neq 0$ Relationship exists between the coefficients of the independent variables; therefore, the regression model is satisfactorily.

A statistical significance level (α) of 0.05 was used in the study. The null was rejected provided the p-value was less than α , and accordingly the alternative was favoured.

As accentuated earlier, this study considered 41 Sub-Saharan African countries that received IMF agreements between 1980 and 2015. The following pages elaborate on the sample selection process employed by this study.

3.5 PARTICIPANT SELECTION

As described earlier in the literature review sections, no studies of this nature have been conducted in SSA, and accordingly SSA countries were used as a sample for this study. Sub-Saharan Africa is home to 48 countries (excluding Northern Sudan) of the 54 African States (World Bank, 2016). Geographically, this area of the African continent is positioned on the southern side of the Sahara desert. (Wikipedia, 2016). Conversely, North African countries are mostly part of the Arab World (Wikipedia, 2016). In 2015, SSA was home to circa 800m people, and had the highest population growth (Federal Ministry of Economic Cooperation and Development, 2016; World Bank, 2016).

Since 1980, 41 countries have received IMF arrangements in Sub-Saharan Africa. Botswana, Eritrea, Namibia, Seychelles and Swaziland did not participate in any IMF arrangements since 1980. The reasons for non-participation were not explored as part of this study, and as such have been excluded from this research. Consequently, the sample number for this study was **41 Sub-Saharan African (SSA) countries**, and are listed below (IMF, 2016b).

Table 3-1: SSA Countries with number and years in IMF Arrangements, 1980 – 2015.

Country	Years	Country	Years	Country	Years	Country	Years
Angola	1	Ethiopia	5	Mauritania	12	Tanzania	9
Benin	6	Gabon	9	Mauritius	4	Togo	9
Burkina Faso	8	Gambia, The	8	Mozambique	7	Uganda	9
Burundi	5	Ghana	10	Niger	11	Zambia	8
Cabo Verde	2	Guinea	8	Nigeria	4	Zimbabwe	5
Cameroon	7	Guinea-Bissau	5	Rwanda	4		
Central African Republic	10	Kenya	12	Sao Tome and Principe	6		
Chad	6	Lesotho	7	Senegal	11		
Comoros	2	Liberia	7	Sierra Leone	9		
Congo, Democratic Republic of	8	Madagascar	12	Somalia	4		
Cote d'Ivoire	12	Malawi	11	South Africa	1		
Equatorial Guinea	4	Mali	11	Sudan	3		

Notes:
1. Source , Adapted IMF (2016b)
2. Botswana, Eritrea, Namibia, Seychelles, and Swaziland excluded from the study

As seen from Table 3-1 above, Cote d’Ivoire, Kenya and Mauritania participated in IMF agreements for a total of 12 years since 1980. Angola and South Africa participated only once. Botswana, Eritrea, Namibia, Seychelles, and Swaziland were excluded from the study since they never received IMF funding for the period under study.

3.6 DATA SOURCES AND ANALYSIS

Consistent with the nature of this study, sources used for the **dependent variables** and FDI net inflows were from the World Bank (World Bank, 2016). **Independent variables** were grouped into, 1) macroeconomic, 2) economic reforms, 3) governance factors, and 4) IMF participation. These are discussed briefly below.

3.6.1 MACROECONOMIC VARIABLES

Macroeconomic variables used in the study were Gross Domestic Product (GDP) per Capita, GDP Growth, Total Reserves, Current Account Balance, Inflation, Trade, and IMF Participation (see Appendices section for definitions of these variables). All variables were lagged by one year as it was assumed that countries were likely to receive renewed investor interest at least one year after participation in IMF agreements. The World Economic Outlook Database (IMF, 2016b) and the World Bank (2016) sources were used for macroeconomic variables (see Appedices Section 7.2 for description and sources of these variables). All variables were lagged by one year as it was assumed that countries were likely to receive renewed investor interest at least one year after participation in IMF agreements. The World Economic Outlook Database (IMF, 2016b) and the World Bank (2016) sources were used for macroeconomic variables. See Appendices Section 7.2 for description and sources of these variables.

3.6.2 TRADE REFORM

Trade liberalisation, which is a form of trade reform often promotes FDI inflows although other countries have chosen in the past to invest in trade in an effort to circumvent potential barriers that may exist (Gastanga *et al.*, 1998). Its measure is simply a summation of goods and services from exports and imports taken as a percentage of GDP. This data and other related variables came from the World Bank (2016). Notably though, growth in exports and imports are often used in the literature even though this is not an ideal proxy for trade reform (Jenson, 2003; Li & Resnick, 2003; Biglaiser & DeRouen, 2007).

3.6.3 GOOD GOVERNANCE FACTORS

The World Economic Outlook Database (IMF, 2016b) provided data on governance factors. These variables were 1) corruption, 2) effectiveness of governance, 3) polity, 4) quality of regulatory environment, 5) type of government (democratic or autocratic), and lastly 6) accountability. The measures ranged from 2.5 to -2.5, with 2.5 being the most democratic score. Whether democratic and or authoritarian regimes were better suited to attract FDI inflows emerged as some of the questions debated at length (Biglaiser & DeRouen, 2010), hence this variable (rule of law) needed to be factored in the model. On the same vein, stability and autonomy issues have also fueled much of the discussions (Biglaiser & DeRouen, 2010; Bird & Rowlands, 2003). Data on good governance factors was only available from 1996, and represented a material gap seeing that the macroeconomic variable data ranged from 1980. For this reason, the good governance factors (variables) were dropped from the study.

3.6.4 IMF PARTICIPATION

Lastly, data on IMF agreements in Sub-Saharan Africa came from the IMF's database (IMF, 2016b). The study used a dummy in the regression model to equal 1 if a country in SSA received IMF assistance in that year, otherwise 0 if it did not receive any IMF assistance (Maddala, 1983; Wooldridge, 2002, Baltagi, 2008). As stressed in the earlier sections of this chapter, this variable presents selection bias issues. The Hausman specification test was employed to determine which of the three regression models (OLS-PCSE, FE, and RE) was appropriate to use for analysis of the findings.

In summary, the models of FDI inflows into SSA encompassed these three themes, as described above: macroeconomic variables, economic reforms, and participation in IMF agreements or facilities.

3.7 DATA ANALYSIS AND PRESENTATION

Consistent with Jenson (2004), Biglaiser and DeRouen (2010), and Al-Sadiq's (2015), a number of data sources for this study were integrated. The World Bank data was used as proxies for control variables (independent variables). For the dependent variable, IMF participation, data from the IMF database was used as proxies (IMF, 2016b). As described in detail above, the study used a two-stage modelling technique to analyse resultant findings. The Hausman specification test was used for robustness to determine which amongst the three regression models was appropriate to use (Wooldridge, 2002; Baltagi, 2008; Greene, 2010).

3.8 RESEARCH RELIABILITY AND VALIDITY

As described in Section 3.4.1.1, participation of a country in an IMF agreement is not a random decision. Using the regression models discussed above allowed for the generation of selected-correction estimates to determine catalytic effects of IMF arrangements of foreign direct investment inflows in SSA. Critically, the first step taken was to determine the catalytic effects of a country opting to receive IMF assistance as depicted by equation one discussed in the earlier sections. Secondly, equation one (selection equation), as an endogenous variable was used to estimate the outcome equation (equation two). Using this approach ensured that the effects of the treatments against the control group where countries did not participate were taken into account.

3.9 LIMITATIONS OF THE METHODOLOGY

The study examined the catalytic effects of IMF arrangements on FDI inflows in SSA. As such countries in North Africa were excluded from this study. Further, any other emerging economies for example the BRIC in the BRICS nations were excluded from the research.

Accordingly, and as discussed at length in Section 1.5.2, the study empirically sought to address these research questions:

1. *What are the catalytic effects that influence Sub-Saharan African (SSA) countries to participate in IMF agreements?*
2. *What are the catalytic effects of FDI inflows that influence investment decisions of MNCs and or foreign investors to invest in SSA?*
3. *Do the catalytic effects of IMF agreements (1 above) influence foreign direct investment inflows (2 above) in SSA?*
4. *Are Sub-Saharan African countries or economies with previous IMF interventions expected to attract more FDI inflows?*

Accordingly, and as discussed above, the potential question, do the catalytic effects of IMF agreements and FDI inflows if any, distinguish the types of IMF conditions that are imposed on them? This question did not form the basis of this study, and was recommended to be included in follow up studies in this line of research.

Chapter 4 below presents the findings and discusses empirical results of this study. It employs the methods and techniques as detailed above for catalysing effects the IMF agreements have in so far as FDI inflows into Sub-Saharan Africa is concerned. Detailed analysis and comparison of the data and findings will provide the opportunity to examine the notion that countries that had previous IMF interventions were likely to attract more FDI inflows from MNCs and or foreign investors.

4 CHAPTER 4: FINDINGS AND DISCUSSION OF RESULTS

RESEARCH FINDINGS

4.1 INTRODUCTION

Chapter 4 considers and discusses results of this study based on 41 Sub-Saharan African countries that participated in IMF arrangements from 1980 until 2015. As a starting point, factors that influenced participation in IMF were deemed to influence multinational corporations and or foreign investors when making decisions about investing in the host countries. Consideration is then given to the robustness of the regression models used in testing these results. Lastly, a summary of the key findings in this section are presented, highlighting the catalysing effects that participation in IMF agreements has on FDI inflows in SSA.

4.2 SAMPLE

Section 3.5 discussed in detail the participant selection process for this study. It confirmed that 41 Sub-Saharan African were considered for this study. The next section discusses findings in relation to the data findings and coding of that data.

4.3 DATA ANALYSIS AND CODING

4.3.1 SUMMARY STATISTICS

Of the **1476 observations** for the period 1980 to 2015, 292 of these participated in IMF agreements since 1980. Those that participated were assigned a dummy variable **one** (1), these totalled 292 for the period under study. The remainder, 1184 did not participate in IMF agreements. These were assigned a dummy variable **zero** (0) in the data sample. *Table 4-1* below presents the rest of the statistics.

Table 4-1: Summary Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum	Observations
IMF Participation	0.1978	0.3985	0.0000	1.0000	1476
Current Account Balance (% of GDP)	-6.0570	10.9127	-147.9973	43.3957	1242
GDP per Capita (US \$)	1042.3610	2104.2890	0.0000	23347.6600	1362
Inflation (annual %)	71.3311	989.1673	-35.8367	24411.0300	1239
Total Reserves (% of external debt)	25.8782	39.4973	-0.1685	449.0795	1300
FDI Inflows (% of GDP)	3.5674	9.9157	-82.8921	161.8238	1331
GDP Growth (annual %)	3.9894	8.4401	-51.0309	149.9730	1359
Trade (% of GDP)	72.1763	51.2479	0.0000	531.7374	1276

The following section focuses on testing the empirical framework discussed in *Section 3.4* and the variables (dependent and independent) that are contained in the models.

4.3.2 CORRELATION MATRIX

The correlation matrix tests whether the independent variables are truly independent. It shows the strengths of association (covariation) between the dependent and independent variables. The matrix indicates the significance level within which the independent variables are significant at. **Positive** values imply that a rise in the value of the independent variable will show a corresponding rise in the dependent variable. **Negative** values imply that as the one value decreases the other increases, and vice versa. The closer the value is to one, the closer the likelihood of an association or relationship between the dependent and the control (independent) variables. A value closest to zero signifies no relationship existence between the variables (dependent and independent). Unlike regression, which implies causality, correlation does not imply causality, but implies association. Consequently, and more importantly, correlation alone **cannot** explain or imply whether one variable causes changes in the other or otherwise. In other words, the above could only be inferred holding all other factors **constant**.

Table 4-2 and Table 4-3 below depict the correlation matrices for both the selection and outcome equations respectively.

4.3.2.1 SELECTION EQUATION: IMF PARTICIPATION

For the selection equation, that is, IMF participation, the correlation with independent variables is shown in Table 4-2 below.

Table 4-2: Correlation Matrix - Selection Equation (IMF Participation)

	IMF Participation	Current Account Balance	GDP Per Capita	Inflation	Total Reserves
IMF Participation	1.0000				
Current Account Balance	-0.0596**	1.0000			
GDP Per Capita	-0.0949***	0.1250***	1.0000		
Inflation	-0.0281	-0.0919***	-0.0165	1.0000	
Total Reserves	-0.1251***	0.1208***	0.3109***	-0.0402	1.0000

Notes:
***, ** and * denote significance level at 1%, 5% and 10% respectively

Noted above is the fact that independent variables correlated negatively with the dependent variable (IMF participation), signifying that an increase in the value of these variables has an opposite effect on the propensity of the country participating in IMF agreements. More specifically, independent variables Current Account Balance, GDP per Capita and Total Reserves correlated significantly with the independent variable (IMF Participation) at 5%, 1% (significance) levels. It is critical to note though that correlation does not necessarily imply causation and or cannot imply that one variable causes the other or otherwise. It is therefore not appropriate to conclude that changes in one variable cause changes in another based-on correlation alone.

Interestingly, there was no association between countries with low levels of inflation and IMF participation, signifying that low levels of inflation did not drive countries to seek IMF facilities. This is consistent with literature (Blejer *et al.*, 2002), in that countries with higher inflation levels

should be the ones with a need to seek IMF assistance. The rest of the correlation between the independent variables is shown as per Table 4-2 above.

4.3.2.2 OUTCOME EQUATION: FDI INFLOWS

Shown below in Table 4-3 are the values of the correlation coefficients which range between plus one and minus one. As alluded to earlier and **holding all other factors constant**, this signifies for instance that a rise in GDP per Capita will imply a slight rise in FDI inflows into SSA, hence the positive value of 0.0259. The rest of the correlation coefficient values are indicated in Table 4-3 with the associated significance levels.

Table 4-3: Correlation Matrix – Outcome Equation (FDI Inflows)

	FDI Inflows	Current Account Balance	GDP per Capita	Inflation	Total Reserves	GDP Growth	Trade	IMF Participation
FDI Inflows	1.0000							
Current Account Balance	-0.4279***	1.0000						
GDP Per Capita	0.0259	0.1250***	1.0000					
Inflation	-0.0118	-0.0919***	-0.0165	1.0000				
Total Reserves	0.1000***	0.1208***	0.3109***	-0.0402	1.0000			
GDP Growth	0.2369***	-0.0775***	0.0252	-0.0468	0.1262***	1.0000		
Trade	0.4480***	-0.2094***	0.2153****	0.0347	0.2004***	0.2996***	1.0000	
IMF Participation	-0.0345	-0.0596**	-0.0949***	-0.0281	-0.1251***	-0.0471*	-0.0275	1.0000

Notes:

***, ** and * denote significance level at 1%, 5% and 10% respectively

Current Account Balance, Total Reserves, GDP Growth, and Trade are all significant at 1% (significance) level with the dependent variable (FDI inflows). For instance, low levels of Current Account Balance tend to correlate positively with FDI inflows. Similarly, countries with high levels of Total Reserves, GDP and Trade tend to be associated with more FDI inflows than those countries that do not.

Remarkably, the correlation matrix for the outcome equation also indicates that there is **no** association between countries that previously participated in IMF and FDI inflows. Likewise, the outcome equation (FDI inflows) revealed no association between Inflation and GDP per Capita with foreign direct investment inflows. The rest of the associations between independent variables are depicted in Table 4-3.

4.3.3 REGRESSION ANALYSIS

As a starting point, it was critical to first estimate the selection equation (IMF participation) to determine the propensity of a country taking part in IMF agreements. Three regression modelling techniques were employed, first the OLS-PCSE, second the FE model, and last the RE model. See Chapter 3 Section 3.3 for a detailed justification on the use of these models. Following the selection equation, the results of the outcome equation (FDI inflows) are also presented. Consistent with the literature, the Hausman specification test informs the choice of either FE or RE.

4.3.3.1 SELECTION EQUATION: IMF PARTICIPATION

As elaborated earlier in the literature section of this report, IMF participation is the dependent variable. The study assumed that countries that were currently under an IMF agreement would likely continue to participate in IMF arrangements, in as far as their macroeconomic conditions may not have steadied. In other words, the very reasons that drove the country in the first instance to seek financial assistance may still be present. It was therefore important to test the dependency of IMF participation to macroeconomic variables. The variables that were deemed to influence IMF participation included Current Account Balance, GDP per Capita, Total Reserves, and Inflation (Jensen, 2004; Biglaiser & DeRouen, 2007). Table 4-4 below presents the outcomes of the regressions models employed in the study. Across the three regression models, changes in IMF participation resulting from one or more changes in the explanatory variables were signified and indicated by the regression coefficients.

Table 4-4: IMF Participation - Selection Equation

Dependent Variable: IMF Participation, 1980 - 2015						
Independent Variables	OLS-PCSE		Fixed Effects		Random Effects	
	Coefficient	z	Coefficient	t	Coefficient	z
Current Account Balance	-0.00205 (0.00127)	-1.61	-0.00232 (0.00160)	-1.45	-0.00205 (0.00127)	-1.62
GDP Per Capita	-0.0000201* (0.00000784)	-2.56	-0.0000220 (0.0000189)	-1.17	-0.0000201* (0.00000966)	-2.08
Inflation	-0.0000187 (0.0000164)	-1.53	-0.0000207 (0.0000168)	-1.23	-0.0000187 (0.0000161)	-1.16
Total Reserves	-0.000985*** (0.000271)	-3.63	-0.000900* (0.000366)	-2.46	-0.000985** (0.000303)	-3.25
Constant	0.238*** (0.0178)	13.35	0.236*** (0.0223)	10.56	0.238*** (0.0182)	13.05
Wald χ^2	36.76				26.66	
F (4,1035)			3.720			
Prob > χ^2 /F	0.000		0.0052		0.0000	
R-squared	0.0242		0.0142		0.0141	
Hausman specification test:						
Hausman χ^2					0.47	
Prob > χ^2					0.9767	
Countries	39		39		39	
Observations	1078		1078		1078	
Notes:						
1. Standard errors in parentheses						
2. ***, ** and * denote significance level at 1%, 5% and 10% respectively						

In the table above, standardised coefficients of the regressors indicate how much the dependent variable will change with increases in independent variables by one unit, **holding all other factors constant**. In other words, countries tend to participate in IMF arrangements as one of the independent variables decrease or increase by one unit, assuming all other factors stay constant. The results presented in Table 4-4 indicate that all standardised coefficients for the independent variables were negative and only the standardised coefficients of GDP per Capita and Total Reserves variables were significant.

Consequently, at these significance levels a country's GDP per Capita and Total Reserves influenced decisions of SSA countries to participate in IMF arrangements or programs. On the contrary, Current Account Balance levels and Inflation variables were not significant across OLS-PCSE, FE and RE models indicating that they did not influence the decision of countries wanting to participate in IMF arrangements. Accordingly, and holding all other factors constant, catalytic effects that drive countries to participate in IMF agreements are **GDP per Capita** and **Total Reserves**. These effects are discussed briefly below.

4.3.3.1.1 SIGNIFICANT VARIABLES

4.3.3.1.1.1 GDP PER CAPITA

GDP per Capita across OLS-PCSE and RE models, was significant at 10% significance level, and nonsignificant for FE model. The negative standardised coefficients indicate the strength and importance of the relationship with the dependent variable. For instance, **and holding all other factors constant**, a negative beta coefficient of 0.0000201 for OLS-PCSE and RE indicates that a change in one standard deviation in Total Reserves, independent variable, will result in an increase of 0.0000201 standard deviations in IMF participation, dependent variable. Similarly, for the FE, a negative 0.000900 beta coefficient indicates that Total Reserves will increase by the same as a result a one unit change in standard deviation, assuming all factors stay constant.

This is consistent with previous literature which found a positive relationship between GDP per Capita and IMF participation (Dick-Mireaut *et al.*, 2000). In other words, low GDP per Capita countries were expected to seek assistance from the IMF. Conversely, Khan (1990) established a not so positive relationship in so far as GDP per Capita and IMF participation were concerned. In fact, countries with low GDP per Capita did not influence participation of IMF agreements (Khan, 1990).

4.3.3.1.1.2 TOTAL RESERVES

Standardised coefficients of the Total Reserves variable across the regression models OLS-PCSE, FE and RE were significant (at 1%, 5%, and 10% levels). The strength and importance of the relationship with the dependent variable is indicated by the negative values. For instance, **and holding all other factors constant**, a negative beta coefficient of -0.000985 for OLS-PCSE and FE signified that a one unit change in standard deviation of Total Reserves increases IMF Participation by 0.000985 standard deviations.

This is consistent with Bird and Graham's (2003) findings, which concluded that IMF arrangements are largely determined from the demand side and that in turn, the demand for IMF assistance is largely driven initially by economic factors that contribute in some way to cause a loss of balance of payments sustainability. Consequently, countries with low total reserves will tend to seek IMF assistance to regain stability and in an effort to improve balance of payments position. There is inconclusive and limited research that indicates otherwise. In other words, a country's higher total reserves are unlikely to influence a country to seek IMF assistance.

4.3.3.1.2 NON-SIGNIFICANT VARIABLES

Why did Current Account Balance and Inflation not yield the expected positive signs? Though not covered as part of this research a brief discussion is perhaps warranted and is offered below.

4.3.3.1.2.1 CURRENT ACCOUNT BALANCE

The results of this study are consistent with Przeworski and Vreeland (2000), who found a negative relationship between Current Account Balance and IMF arrangements. On the contrary, Connors (1979) established that balance of payments position was not improved by those countries that participated in IMF agreements. These findings are perhaps not alarming. Conversely though, Khan (1990), Khan and Hague (1998), Stone (2002) and, Bird and Graham (2003) found a positive relationship between Current Account Balance and participation in IMF agreements. They found that IMF arrangements generally were successful in stabilising economies and improving balance of payments.

4.3.3.1.2.2 INFLATION

Dependable with views from various authors on the negative relationship between inflation and IMF participation (Khan, 1990; Vreeland, 2003; Jenson, 2004), the findings on inflation and the impact it has on IMF agreements is perhaps not alarming. However, Dicks-Mireaux *et al.* (2000), found that there was no propensity for IMF participation for those countries with higher and or lower inflation.

In addition to the discussion above, it was generally suspected that the propensity of a country wanting to participate in IMF arrangements may not have been captured. This is so given that some countries may choose to participate in IMF programs just to get hold of the IMF conditionality in order to improve their economic conditions or imbalances, but not necessarily want financial assistance. Such countries may have alternative sources of financing. Consequently, a country's engagement motivations in so far as participating in IMF arrangements, needed to be explored further.

This view is supported by Al-Sadiq (2015). Further, this could be attributed to a concept of group heterogeneity. In other words, countries in SSA are not homogenous and thus deal with external shocks to their environments differently (Dabla-Norris & Gündüz, 2012). Lastly, the selection regression models may not have significantly captured the true relationship between the propensity to participate in IMF arrangements and these control variables due to non-linearity effect given that these control variables are nonlinear.

4.3.3.1.3 OVERALL SIGNIFICANCE: F-TEST

Accordingly, and looking at the overall F test of $F(4, 1035) = 3.720$ for the Fixed Effects model, and χ^2 values for the OLS-PCSE and Random Effects models, the p – values are less than 0.05 across the three models, signalling that the regression model for the selection equation is satisfactory and that the standardised coefficients are significant, that is, different from zero. Lastly, and looking at the R-Squared values of 0.0242 and 0.0142 for OLS-PCSE and FE respectively, the

amount of variance of the IMF participation that is explained by the Current Account Balance, Inflation, GDP per Capita, and Total Reserves, is relatively very small, and the reasons attributable to this phenomenon were discussed above.

4.3.3.1.4 FIXED OR RANDOM EFFECTS

The p-value, **Prob > χ^2 = 0.9767**, because is higher than **0.05** (the significance level), and therefore not significant, the null hypothesis was not rejected at 0.05 significance level. Consequently, the Random Effects model was favoured over the Fixed Effects for the selection equation. Using this model, it follows therefore that for the selection equation, the standardised coefficients of GDP per Capita and Total Reserves influenced respectively SSA countries in choosing to participate in IMF agreements at significance levels 5% and 10% (see *Table 4-4*).

The next section discusses the results of the outcome equation, FDI inflows into Sub-Saharan African countries.

4.3.3.2 OUTCOME EQUATION: FDI INFLOWS

The table below (*Table 4-5*), presents results of the *outcome equation* (FDI inflows) which examined the effects of participating in IMF arrangements on FDI inflows in Sub-Saharan Africa. Similar to the results presented in *Table 4-4* above, the regression equation was estimated using the OLS-PCSE, FE and RE models. Consistent with the literature, the Hausman specification test informed the choice of whether FE or RE was a preferred model.

Table 4-5: FDI Inflows: Outcome Equation

Dependent Variable: FDI Inflows, 1980 - 2015						
Independent Variable	OLS-PCSE		Fixed Effects		Random Effects	
	Coefficient	z	Coefficient	t	Coefficient	z
GDP Growth	-0.00690 (0.0467)	-0.15	-0.0338 (0.0335)	-1.01	-0.0355 (0.0336)	-1.06
Trade	0.0603*** (0.0130)	4.65	0.0265** (0.00906)	2.93	0.0489*** (0.00734)	6.65
Current Account Balance	-0.271*** (0.0450)	-6.03	-0.217*** (0.0236)	-9.21	-0.245*** (0.0229)	-10.73
GDP Per Capita	-0.000414** (0.000140)	-2.96	0.00000407 (0.000262)	0.02	-0.000188 (0.000214)	-0.88
Inflation	-0.000612 (0.000400)	-1.53	-0.000649** (0.000230)	-2.82	-0.000665** (0.000232)	-2.86
Total Reserves	0.0203*** (0.00551)	3.69	0.0197*** (0.00512)	3.84	0.0214*** (0.00495)	4.32
IMF Participation	-0.676 (0.474)	-1.42	-0.358 (0.447)	-0.80	-0.419 (0.453)	-0.92
Constant	-2.366** (0.849)	-2.79	-0.0957 (0.696)	-0.14	-1.333 (0.691)	-1.93
Wald χ^2	52.26				201.2	
F (7,938)			16.61			
Prob > χ^2 /F	0.000		0.0000		0.0000	
R-squared	0.276		0.110		0.1068	
Hausman specification test:						
Hausman χ^2			33.12			
Prob > χ^2			0.0000			
Countries	37		37		37	
Observations	982		982		982	
Notes:						
1. Standard errors in parentheses						
2. ***, ** and * denote significance level at 1%, 5% and 10% respectively						

Standardised coefficients indicate how much the dependent variable FDI inflows will change when one of the independent variables increases by one unit, **holding other all factors constant**. For instance, a beta coefficient of 0.0603 for OLS-PCSE signified that a one unit change in standard deviation of Trade increases FDI inflows by 0.0603 standard deviations (See Table 4-5). Standardised regression coefficients are important because they reveal which of the independent variables are important in influencing the dependent variable, FDI inflows. Consequently, across all three regression models as depicted in Table 4-5, it was evident that Trade, Current Account Balance, GDP per Capita, and Total Reserves impacted significantly FDI Inflows into SSA than the rest of the variables in the models.

4.3.3.2.1 SIGNIFICANT VARIABLES

Table 4-5 above presents results of OLS-PSCSE, FE, and RE models. It was evident from these results that standardised coefficients of the independent variables were positive for Trade and Total Reserves. The standardised coefficients for GDP Growth, Current Account Balance, GDP per Capita, Inflation, and IMF Participation were negative. In terms of significance, across all three models, Trade, Current Account Balance, Inflation and Total Reserves were significant at the various significance levels (see Table 4-5). These variables are discussed below in detail. The

Hausman specification favoured FE model over the RE model. Consequently, GDP per Capita was not significant.

4.3.3.2.1.1 TRADE

Standardised coefficients of the Trade variable across the three models OLS-PCSE, FE and RE were significant at significance levels 0.001, 0.05, and 0.001 respectively. The positive standardised coefficients indicate the strength and importance of the relationship with the dependent variable as discussed above.

This is supported by literature which states that access to markets with trade protection among others as one of the key benefits accruing from FDI inflows (Jensen, 2004). Further, studies by Narendra (2014), gestured and concluded positively a correlation when it came to trade openness and FDI inflows. Multinational corporations and or foreign investors tended to inject FDI into host countries in most instances if trade openness was high (Narendra, 2014).

Evidently, the report published by the UNCTAD (2015), supported this view. It indicated that multinational corporations (MNCs) were hugely responsible for trade into SSA countries in the last three decades, which supports positively that Trade and FDI inflows are correlated.

4.3.3.2.1.2 CURRENT ACCOUNT BALANCE

From Table 4-5 above, Current Account Balance was significant at the 0.001 (significance) level across all three regression models. This is consistent with existing literature that posits that Current Account Balance influence positively FDI inflows (Siddiqui *et al.*, 2013; Arabi, 2014). However, in the long run, FDI inflows may erode Current Account Balance due to the weak association. A policy implication for SSA countries is therefore to ensure that negative influences of Current Account Balance are taken into account when implementing policies that seek to help countries attract FDI inflows, more specifically those policies that could have long range effects.

Consequently, across all three models used in the study, Current Account Balance significantly influenced FDI inflows into SSA for the period under study. Notably though, for the Trade variable, standard errors were marginally higher if compared to those of the other variables, which may mean *lower significance* (see Table 4-5).

4.3.3.2.1.3 TOTAL RESERVES

Scrutinizing Table 4-5 above, the Total Reserves variable was significant across all three models used in the study at the 0.001 (significance) level. This is consistent with literature especially from Khan and Khachoo (2012) that concluded that the accumulation of total reserves seemed to help developing countries attract FDI inflows as a country that amassed more reserves seemed to influence multinational corporations or foreign investors' decisions and helped the host country to attract foreign direct investment. This was also supported by Narendra (2014) who posited that high levels of Total Reserves reflected the strength of external payments and vice versa. Popov and Polterovich (2002) further alluded to the fact that the accumulation of Total Reserves contributed

to economic growth if measured as a percentage of GDP, more particularly it increased investments domestically from foreign investors and or MNCs.

Moreover, the positive sign on standardised coefficient of Total Reserves indicates how much the dependent variable FDI inflows will change when Total Reserves increase by one unit, holding all other factors constant. For example, in the FE model, results in *Table 4-5* show that a beta coefficient of 0.0197, signaling that a one unit change in standard deviation of Total Reserves increases FDI inflows by 0.0197 standard deviations, **holding all other factors constant**.

Consequently, and in line with the regression results above, Total Reserves were found to influence FDI inflows positively into Sub Saharan Africa.

4.3.3.2.1.4 INFLATION

At the 0.05 (significance) level, standardised coefficients for Inflation were significant for the FE and RE regression models, and not significant for the OLS-PCSE regression model. Holding all factors **constant**, a one unit decrease in Inflation tended to influence FDI inflows positively into SSA using the FE and RE models. If modelled through the OLS-PCSE model, **Inflation** would not influence the inflow of FDI into SSA countries for the period defined.

Consistent with the literature on factors that drive FDI inflows into the host countries, several authors established that a good indicator of economic stability was inflation, in that countries with low inflation tended to attract FDI inflows, and vice versa, countries with high inflation ward off FDI inflows (Masca and Demirhan, 2008; Narendra, 2014; Sayek, 2009). The negative sign in the coefficient of Inflation in the regression models presented, further supports the literature review in that low inflation was effective in attracting FDI inflows in SSA. However, as alluded above, the OLS-PCSE model yielded insignificant results if compared to the FE and RE models whose results were significant at 0.01 (significance) level.

4.3.3.2.2 NON-SIGNIFICANT DEPENDENT VARIABLES

4.3.3.2.2.1 GDP GROWTH

As highlighted in the literature review, FDI is meant to be growth enhancing in the same way that domestic investment is. Narendra (2014) for example, found that countries with higher GDP attracted far more FDI inflows than those without. In fact, Artige and Nicolini (2005) have argued that the most robust determinant of FDI inflows is GDP, more than ever for horizontal foreign direct investment. Interestingly, Hansen and Rand (2006) established a bi-directional causality for the variables FDI inflows and GDP Growth. They argued that FDI inflows were not impacted positively in the long term by GDP. They actually contended that FDI inflows resulted in increases in GDP and not the other way around. Perhaps this holds true in the context of this study given the insignificant nature of the findings presented above (See *Table 4-5*).

In the regression results presented in *Table 4-5*, GDP growth was found to be insignificant across the three models. On the contrary, Jensen (2004) pointed out that there seemed to be a consensus that improvements in GDP growth will likely drive FDI inflows into the host country provided that

the country has reached the least possible levels of education, infrastructure and technological advancement.

Consequently, the results of the regression models challenged this popular belief that high levels of GDP cause FDI to flow into the host countries. Recently though, an argument can be advanced that this is perhaps attributed to the slowdown of FDI inflows in SSA since the global financial crises (UNCTAD, 2015). Another factor could be attributed to a slowdown in commodity prices, which affected GDP growths, hence a shrinkage in FDI inflows in Sub-Saharan Africa.

4.3.3.2.2 GDP PER CAPITA

In the literature, how GDP per Capita and FDI inflows relate is far from unanimous as various authors have presented conflicting results. Chowdhury and Mavrotas (2005) found that foreign direct investment inflows correlated positively with GDP per Capita and that the relationship was uni-directional. More specifically, GDP per Capita growths attracted FDI inflows into the host countries. At the same time, Edwards (1990) established a negative relationship between GDP per Capita and FDI inflows.

The results presented in *Table 4-5* indicated that low GDP per Capita tended to influence FDI inflows positively when using the OLS-PCSE model at a 0.01 (significance) level. For the FE and RE models, the results were insignificant. These results are supported by the work done by Hausmann and Fernandez-Arias (2000) which found insignificant differences between GDP per Capita and the FDI inflows. According to Park (2011), if the FE and RE models are both insignificant which was the case in terms of the GDP per Capita variable, the OLS-PCSE model is preferred.

Accordingly, GDP per Capita was found to influence FDI inflows in Sub-Saharan African countries at a 0.05 (significance level) (see *Table 4-5*).

4.3.3.2.3 IMF PARTICIPATION

As a start, the regression results indicated negative regression coefficients for the IMF Participation variable for all three regression models (see *Table 4-5*). Holding all factors **constant**, this implies that a change in FDI inflows (dependent variable) resulted in a decrease by one unit in the independent variable, IMF Participation. For instance, 0.358 negative beta coefficient for FE model signified that a change in one standard deviation in the IMF Participation (independent variable) resulted in a 0.358 standard deviations decrease in FDI inflows. This is also true for the RE model, with a slightly higher negative beta coefficient of 0.419, which signifies that a change in one standard deviation in the IMF Participation (independent variable) will result in a 0.419 standard deviations decrease in FDI inflows if the RE model was used.

Accordingly, this was expected given the conflicting set of results from previous studies. Mody and Saravia (2003), Brune *et al.* (2004), and Al-Sadiq (2015) had indicated and established that IMF participation and FDI inflows were positively correlated. On the other hand, inconclusive

results were also reported by Faini *et al.*, (1991), Hajivassiliou (1987) and, Mody and Saravia (2003).

So what explains the continued participation in IMF arrangements, if based on these results, participation in IMF arrangements, was found to be non-significant? Jenson (2004) found that countries tended to participate in IMF agreements due to past IMF interventions. Further, past participations in IMF arrangements were a strong predictor to indicate if a country would continue to participate or not. The other reason for this might be that once a country participated in IMF arrangements, it was then bound by the IMF conditionality (Vreeland, 2003), and the country was now constrained by macroeconomic policies and the need to improve the conditions forced to continuously ask for IMF assistance. Other reasons indicated included recidivism and total debt burdens that the countries were subjected to, and possibly low levels of total reserves (Jenson, 2004).

4.3.3.2.3 OVERALL SIGNIFICANCE: F-TEST

Accordingly, and looking at the overall F test of $F(7,938) = 16.61$ for the FE model, and χ^2 values for the OLS-PCSE and the Random Effects models, 52.5 and 201.2 respectively, the p – values are less than 0.05 across the three models, signalling that the regression model for the selection equation is satisfactorily and the regression coefficients are different from zero. Alternatively stated, at a 0.05 (significance) level, the overall model is significant. Consequently, the null is favoured against the alternative.

Lastly, and observing the values of R–Squared, that is, 0.276 and 0.110 for OLS-PCSE and FE models respectively, the independent variables explain 27% and 11% of the variance in FDI inflows for OLS-PCSE and FE respectively.

Thus, it follows that the independent variables Trade, Current Account Balance, GDP per Capita, Inflation, and Total Reserves, influenced decisions of multinational corporations significantly in seeking to direct FDI inflows into Sub-Saharan African countries.

Lastly, the study also compared the results of *Table 4-5* with regression models that did not treat IMF participation as an endogenous variable. The following observations depicted in *Table 4-6* were made.

Table 4-6: FDI Inflows: Outcome Equation (excluding IMF participation)

Independent Variables	Dependent Variable: FDI Inflows					
	OLS-PCSE Coefficient	z	Fixed Effects Coefficient	t	Random Effects Coefficient	z
GDP Growth	-0.00558 (0.0466)	-0.12	-0.0336 (0.0335)	-1.00	-0.0352 (0.0336)	-1.05
Trade	0.0602*** (0.0130)	4.64	0.0267** (0.00905)	2.95	0.0484*** (0.00739)	6.55
Current Account Balance	-0.270*** (0.0449)	-6.01	-0.216*** (0.0236)	-9.18	-0.244*** (0.0229)	-10.66
GDP Per Capita	-0.000399** (0.000139)	-2.88	0.0000131 (0.000262)	0.05	-0.000172 (0.000216)	-0.80
Inflation	-0.000599 (0.000402)	-1.49	-0.000641** (0.000230)	-2.79	-0.000656** (0.000232)	-2.83
Total Reserves	0.0210*** (0.00546)	3.85	0.0200*** (0.00510)	3.92	0.0217*** (0.00494)	4.40
Constant	-2.527** (0.848)	-2.98	-0.193 (0.685)	-0.28	-1.394* (0.690)	-2.02
Wald χ^2	51.08				197.1	
F (6,939)			19.27			
Prob> χ^2 /F	0.000		0.0000		0.0000	
R-squared	0.275		0.110		0.1064	
Countries	37		37		37	
Observations	982		982		982	

Notes:
1. Standard errors in parentheses
2. ***, ** and * denote significance level at 1%, 5% and 10% respectively

These results are not much different, the overall F test is still significant at 0.05 (significance) level. Notably, the regression coefficients are marginally different from the main models with the endogenous variable incorporated.

To test which effect (random or fixed), the OLS-PCSE, FE and RE models were preferred for the study in the outcome equation, the Hausman test was conducted, described to here below.

4.3.3.3 ROBUSTNESS CHECK: HAUSMAN TEST

4.3.3.3.1 FIXED OR RANDOM EFFECTS

Since the p-value ($\text{Prob} > \chi^2 = 0.0000$) was less than 0.05 (significance level), the null was rejected in favour of the alternative hypothesis. Consequently, **Fixed Effects** model was favoured over the Random Effects model for the outcome equation. Using this model, it follows thereof that for the outcome equation, the standardised coefficients of *Trade*, *Current Account Balance*, *Inflation* and *Total Reserves* were all significant (0.05, 0.001, 0.05 and 0,001 significance levels) at influencing multinational corporations and or foreign investors in directing foreign direct investments into SSA countries.

4.3.4 SUMMARY

This section has presented findings that provided insight into the catalytic impacts and consequences of IMF arrangements on FDI inflows in SSA, highlighting similarities, differences, and distinctions of independent variables examined. Consequently, an understanding of the nature and underlying factors influencing FDI inflows in Sub-Saharan Africa was established.

For the first equation, the selection equation (**IMF Participation**), lower GDP per Capita and Total Reserves were significant in influencing IMF participation for SSA countries. On the other hand, lower levels of Current Account Balance and Inflation did not significantly impact or affect countries in choosing to participate in IMF arrangements.

Overall, IMF participation was significant and influenced by the GDP per Capita and Total Reserves.

With respect to the second equation, the outcome equation (**FDI Inflows**), high levels of Trade and Total Reserves, low Current Account Balance, and lower Inflation levels influenced FDI inflows into Sub-Saharan African countries significantly. GDP growth, GDP per Capita and the endogenous variable IMF Participation did not influence FDI inflows for SSA countries.

Ultimately, and holding all **other factors constant**, FDI Inflows was significant and influenced by high levels of Trade and Total Reserves, low levels of Current Account Balance, and lower Inflation levels.

Accordingly, the sections that follow draw on these results to discuss some of the issues and implications from this study.

DISCUSSION OF RESEARCH QUESTIONS AND HYPOTHESES

4.4 DISCUSSION OF RESEARCH QUESTIONS AND HYPOTHESES

The previous section presented findings to provide insights into the catalytic effects of IMF agreements that influence investment decisions of foreign multinational corporations or investors when seeking to invest into SSA countries. In other words, it provided insights to answer the question, Do IMF agreements influence FDI inflows into SSA?

This section discusses and considers findings of the catalytic effects of IMF arrangements that influence countries to participate in IMF agreements, and how these affect investment decisions of multinational corporations and or foreign investors when choosing to invest in SSA. The first section discusses findings of the selection equation, that is, IMF participation. This is followed by a discussion at length of the outcome equation, catalytic effects of foreign direct investment inflows with the endogenous variable embedded in the regression equations.

Ultimately, the purpose of this section is to address the ‘what’ and ‘how’ of the catalytic effects of IMF arrangements on FDI inflows in SSA as well as emergent findings with respect to the outcomes of IMF agreements and foreign direct investment inflows in SSA. Lastly, Section 5.3 summarises the issues addressed in this chapter.

4.4.1 RESEARCH QUESTIONS AND HYPOTHESES

Central to this study was the research question, what are the catalytic effects of IMF agreements or arrangements on FDI inflows in SSA?

More specifically, were there any specific catalysing effects for countries with IMF interventions for the period under study, and by extension has that contributed in foreign direct investment inflows into those countries, with a particular focus in this instance Sub-Saharan Africa?

This research question was then further broken down into four specific questions. Hypotheses statements were then formulated alongside these. These research questions and hypotheses are discussed in the next section.

RQ1: What are the catalytic effects that influence SSA countries to participate in IMF agreements?

Past research has indicated that four variables, namely Current Account Balance, GDP per Capita, Total Reserves and Inflation, have been the determinants of countries wanting to participate in IMF agreements. This study has shown that since 1980 until 2015, for the Sub-Saharan African countries, only GDP per Capita and Total Reserves were significant in determining the decisions driving countries to participate in IMF agreements. As discussed previously, **Total Reserves and GDP per Capita** influenced decisions of SSA countries to participate in IMF arrangements or programs. On the contrary, Current Account Balance and Inflation variables were not significant

for the OLS-PCSE, FE and RE models at 10%, 5% and 1% levels (significance) respectively, implying that they did not influence the decision of countries wanting to participate in IMF arrangements. Accordingly, this study found that, catalytic effects that drive countries to participate in IMF agreements were **Total Reserves** and **GDP per Capita**.

A perspective was also discussed in Section 4.3.3 as to the reasons why the other two variables, Current Account Balance and Inflation were not significant catalytic effects of IMF agreements or participation for the period under study. One of the reasons included the fact that countries may have sought to participate in IMF agreements for the sake of getting hold of the IMF conditionality in order to improve their economic conditions or imbalances, but did not necessarily need IMF assistance as some of these countries may have had alternative sources of financing.

Factors which may also be reasons for this phenomenon included a country's *engagement motivations, group heterogeneity and non-linearity effects* (see Section 4.3.3). Lastly, the selection regression model may not have significantly captured the true relationship between the propensity to participate in IMF arrangements and the control variables due to *non-linearity* effect given that the control variables or independent variables are nonlinear.

4.4.1.1 H₁: CATALYTIC EFFECTS OF IMF AGREEMENTS INFLUENCE SUB-SAHARAN AFRICAN COUNTRIES TO PARTICIPATE IN IMF ARRANGEMENTS.

Results of the regression models concluded that **GDP per Capita** and **Total Reserves** of a country were statistically significant and influenced the decision of SSA countries to participate in IMF arrangements. On the contrary, Current Account Balance levels and lower Inflation were not significant in influencing IMF participation.

Consequently, catalytic effects, **GDP per Capita** and **Total Reserves**, influence participation in IMF arrangements or agreements of Sub-Saharan African countries.

RQ2: What are the catalytic effects of FDI inflows that influence investment decisions of foreign investors to invest in SSA?

In accordance with previous research discussed in the literature review section of this report, GDP growth, Trade, Current Account Balance, GDP per Capita, Inflation, Total Reserves, and IMF Participation (the endogenous variable from the selection equation), were deemed to influence FDI inflows into SSA countries. Section 4.3.5 presented in detail for the outcome equation key findings and insights in this regard. It was revealed that **Trade, Current Account Balance, Inflation and Total Reserves** influenced significantly investment decisions of multinational corporations and investors who sought to invest in SSA. **GDP growth, GDP per Capita and IMF participation** were insignificant in influencing investment decisions of multinational corporations or investors.

Consequently, and **holding all other factors constant**, high levels of Trade and Total Reserves as well as low levels of Current Account Balance and lower Inflation, significantly influenced multinational corporations and or foreign investors to direct FDI inflows into SSA countries. Conversely, GDP Growth, GDP per Capita, and IMF participation did not influence multinational corporations and or foreign investments when making decisions to direct FDI inflows into SSA.

4.4.1.2 H₂: CATALYTIC EFFECTS OF FDI INFLOWS INFLUENCE INVESTMENT DECISIONS OF FOREIGN INVESTORS TO INVEST IN SSA

As discussed extensively above (Section 4.3.3), empirical results of the regression models concluded that a country's Trade, Current Account Balance and Total Reserves, influenced decisions of foreign multinational corporations and or investors who sought to invest in Sub-Saharan African countries.

Accordingly, catalytic effects, *Trade*, *Current Account Balance*, *Inflation*, and *Total Reserves* influenced investment decisions of multinational corporations and or investors in investing in Sub-Saharan African countries.

RQ 3: Do the catalytic effects of IMF agreements (FDI) inflows in Sub-Saharan Africa?

Central to answering this research question, RQ1 and RQ2 were considered, and RQ3 was then framed. That is, *do the catalytic effects of IMF agreements or arrangements influence foreign direct investment (FDI) inflows in Sub-Saharan Africa?*

Research Question 1 as discussed in Section 5.2.1 concluded that GDP per Capita and Total Reserves were significant at influencing SSA countries to choose to participate in IMF agreements or not. At the overall significance level, an F-test was conducted and concluded that though Inflation and Current Account Balance were not significant individually at influencing decisions of SSA countries in choosing to enter into IMF arrangements, the regression models (OLS-PCSE, FE and RE) **jointly** were significant in influencing the decisions of SSA countries in participation in IMF arrangements. This was fully discussed in Section 4.3.3.1 above. *Table 4-7* below summarises this finding and insights coherently.

Table 4-7: IMF Agreements’ influence on FDI inflows

Do the catalytic effects of IMF agreements influence FDI inflows in SSA?

Independent Variables	IMF Participation (Selection Equation)	FDI Inflows (Outcome Equation)
GDP Per Capita	√	√
Total Reserves	√	√
Inflation	x	√
Current Account Balance	x	x
Trade		√
IMF Participation		x
GDP Growth		x
F-Test Significance	√	√

Notes:
√ Statistically Significant
x Statistically Insignificant

Source: Researcher own analysis

The first column, IMF participation (selection equation), in Table 4-7 serves to answer Research Question 1 in terms of countries participating in IMF agreements. As can be noted from above, only GDP per Capita and Total Reserves were individually statistically significant. However, the overall model is still significant using the F-test overall significance.

The second column, FDI inflows (outcome equation), reveals that GDP per Capita, Trade, Inflation and Total Reserves were statistical significant determinants of FDI inflows in SSA. Fundamental to observe here that **GDP per Capita** and **Total Reserves** were also catalytic effects for FDI inflows. Consequently, catalytic effects GDP per Capita and Total Reserves for IMF participation catalysed FDI inflows in SSA. Moreover, it is key to note here is that Current Account Balance, for both IMF participation dependent variables (selection equation), and FDI inflows (outcome equation), were not statistically a significant determinant of IMF participation or FDI inflows in SSA. This is truly remarkable as past literature on other studies done in other regions indicated otherwise. For instance, Przeworski and Vreeland (2000) found a negative relationship between participation in IMF arrangements and Current Account Balance. Haque and Khan (1998) and Stone (2002), found a positive relationship between IMF participation and Current Account Balance. Connors (1979) found no effect or correlation caused whatsoever between IMF arrangements or agreements and Current Account Balance (See chapter 2 Table 2.1, Section 2.6 for a summary of this analysis).

In terms of FDI inflows and Current Account Balance relationship, Siddiqui *et al.* (2013), established that FDI inflows and Current Account were co-integrated and tended to exhibit a long-run relationship. They also found that this relationship was in most instances uni-directional, because Current Account Balance influenced FDI inflows, and not the other way around, that is, FDI inflows influenced Current Account Balance.

The key insights gained from this study is that for SSA countries, Current Account Balance (if taken in isolation, and **holding all other factors constant**) does not significantly influence countries participating in IMF arrangements. Further, as highlighted above, it does not influence the decisions of foreign multinational corporations and investors in making decisions with regards to investing in SSA economies.

4.4.1.3 H₃: CATALYTIC EFFECTS OF IMF AGREEMENTS INFLUENCE FDI INFLOWS IN SSA

Section 4.4.1.1 discussed in detail the hypothesis with regards to the catalytic effects of IMF agreements in SSA. It indicated and concluded through the test of individual coefficients, only **GDP per Capita** and **Total Reserves** were not equal to zero and therefore significant, whilst **Current Account Balance** and **Inflation** were not significant. The overall F-test proved that *jointly*, the coefficients were not equal to zero and therefore fitted the regression models better.

Section 4.4.1.2 on the other hand, discussed the hypothesis with regards to the catalytic effect of FDI inflows in SSA. In short, it established what effects influenced the decisions of foreign investors and or MNCs when it came to investing in SSA countries. The test of individual coefficients concluded that *GDP per Capita*, *Total Reserves*, *Inflation*, and *Trade* were not equal to zero and therefore **significant**, whilst *GDP Growth*, *Current Account Balance* and *IMF participation* were **not significant**. The overall F-test proved though that *jointly*, the coefficients were not equal to zero and therefore **fitted** the regression models better.

Accordingly, and **holding all other factors constant**, *GDP per Capita*, *Total Reserves* (catalytic effects for both IMF participation and FDI inflows), *Inflation*, and *Trade* are the catalysing effects that influenced investment decisions of MNCs and or foreign investors that sought to invest in Sub-Saharan African countries for the period under study. This is depicted and summarised in *Table 4-7* above.

Fittingly, and corollary from the above, catalytic effects of IMF arrangements or agreements (*GDP per Capita* and *Total Reserves*) influenced FDI inflows for SSA countries.

RQ 4: Are Sub-Saharan African economies with previous IMF interventions expected to attract more FDI inflows?

As a start, it is crucial to recap that limited studies have been conducted in this regard. No studies of this nature have been conducted for Sub-Saharan Africa at all which is why it formed part of the focus of this study. Studies that were conducted in other regions, as discussed extensively in the literature review, found conflicting and inconsistent results. For instance, a positive correlation between IMF arrangements or agreements and FDI inflows was established by several authors (Mody and Saravia, 2000; Brune *et al.*, 2004; Al-Sadiq, 2015). With that said, Jenson (2004) found negative correlation between countries that participated in IMF arrangements and the levels of FDI inflows they attracted. In particular, those countries that sought IMF assistance or participated in

IMF arrangements, were the ones that tended to attract less FDI inflows, if compared to those that did not seek assistance.

Lastly, and as articulated in detail earlier in this report, other studies were inconclusive in this regard. For instance, Hajivassiliou (1987), and Faini *et al.* (1991) were uncertain on the correlation as far as FDI inflows and IMF agreements was concerned. (See *Table 2.1, Section 2.6* for a summary of this analysis).

Table 4-3 in Section 4.3.2 showed that there was no association between IMF participation and FDI inflows. The correlation results between these two variables indicated a -0.0345 negative association with a significance level way above the benchmark p-value of 0.05. The p-value was reported as 0.2089, which implied that if there was any association, this could only be expected 20.89% of the time.

The next section briefly discusses the regression analysis results in this regard to try and prove or disprove the hypothesis that *SSA economies or countries with previous IMF interventions or arrangements were expected to attract more foreign direct investment (FDI) inflows.*

4.4.1.4 H₄: SSA COUNTRIES WITH PREVIOUS IMF INTERVENTIONS ARE EXPECTED TO ATTRACT MORE FDI INFLOWS

As accentuated empirically in Section 4.4.3 above, and depicted in *Table 4-7* above, the endogenous variable, IMF participation was not significant in influencing foreign investors or multinational corporations when seeking to invest in SSA.

Consequently, and **holding all other factors constant**, the hypothesis that *Sub-Saharan African countries with previous IMF interventions were expected to attract more FDI inflows* is rebutted.

4.5 SUMMARY

This chapter discussed the insights gained with regards to the catalytic effects of IMF arrangements or agreements on foreign direct investment (FDI) inflows in Sub-Saharan Africa, considering both findings from this study together with prior research done in this domain. The four research questions together with their hypotheses were discussed in detail. The study concluded the following:

- 1) GDP per Capita and Total Reserves are the catalytic effects that influence Sub-Saharan African countries to participate in IMF agreements.
- 2) GDP per Capita, Total Reserves, Inflation and Trade are the catalytic effects that influenced investment decisions of foreign multinational corporations and or investors that sought to invest in Sub-Saharan Africa countries.
- 3) Catalytic effects of IMF arrangements or agreements, 1) above, influenced foreign direct investment (FDI) inflows in SSA.
- 4) Sub-Saharan African economies or countries with previous IMF interventions were not expected to attract more FDI inflows.

Subsequently, all three of the four research hypotheses were confirmed truthful with the exception of the last one, that Sub-Saharan African economies or countries with previous IMF interventions or arrangements were expected to attract more foreign direct investment (FDI) inflows. That is, Sub-Saharan African countries or economies with previous IMF interventions are not expected to attract more FDI inflows.

Chapter 5 below concludes the research on the study of catalytic effects of IMF agreements or arrangements on FDI inflows in SSA by 1) emphasizing empirical discoveries and conclusions, 2) drawing on the practical and theoretical contributions made, 3) recognising any limitations inherent to this study, and 4) proposing and identifying areas of recommendation for future research in order to further develop the understanding of IMF agreements or arrangements and their impact on FDI inflows in SSA.

5 CHAPTER 5: CONCLUSIONS

5.1 OVERVIEW OF THE STUDY

This study has examined catalytic effects of IMF arrangements or agreements on FDI inflows in SSA comprising 41 countries that have received IMF arrangements between 1980 and 2015. Whilst numerous studies have been completed in this domain in recent years, none have focused on IMF agreements and the catalysing effects they have on FDI inflows in SSA. Moreover, for those studies that have been conducted in this space, their conclusions and empirical results are inconsistent and constantly evolving.

Accordingly, using an unbalanced fixed panel data approach this study sought to address chiefly the research question, ‘What are the catalytic effects of IMF agreements or arrangements on FDI inflows in SSA? Or put differently, ‘Do IMF agreements or arrangements influence FDI inflows in SSA?

In order to address this question, specific objectives were defined. 1) To establish the catalytic effects of IMF agreements that influenced the participation in IMF program for SSA countries. 2) To establish the catalytic effects of foreign direct investment (FDI) inflows that impact and or influence investment decisions of foreign investors and or MNCs when seeking to invest in SSA. 3) To determine if these catalytic effects in 1) above, influenced FDI inflows in SSA. 4) To ascertain if Sub-Saharan African countries or economies with previous IMF interventions or arrangements were expected to increase FDI inflows into these countries. These objectives were discussed and addressed under hypotheses 1, 2, 3, and 4 (See Section 4.4.1).

The study used a fixed unbalanced paneled data set comprising 41 SSA countries on the African continent which received IMF arrangements since 1980 until 2015. Discussion of the empirical findings and results reflecting on insights gained from this study have been presented. The study considered these insights in the context of prior research evidenced in the literature review – identifying similarities and reconciling differences.

This chapter then concludes the research on the study of catalytic effects of IMF agreements or arrangements on FDI inflows in SSA by **a)** emphasizing empirical discoveries and conclusions, **b)** drawing on the practical and theoretical contributions made, **c)** recognising any limitations inherent to this study, and **d)** proposing and identifying areas of recommendation for future research in order to further develop the understanding of IMF agreements or arrangements and their impact on FDI inflows in SSA. The issues described above are summarised in the sections below.

5.2 SIGNIFICANT FINDINGS

A significant number of empirical findings and conclusions with regards to IMF agreements or arrangements and FDI inflows in SSA have been noted throughout this research. Further, a number of interesting insights have emerged specific to some of the determinants or catalysing effects of IMF agreements and FDI inflows in the context of SSA. In this section, significant findings and conclusions that emerged from the nature of this study are reviewed.

5.2.1 CATALYTIC EFFECTS OF IMF AGREEMENTS OR ARRANGEMENTS

This study has found that **GDP per Capita** and **Total Reserves** influenced decisions of SSA countries to participate in IMF arrangements. Current Account Balance and Inflation did not influence decisions of SSA countries wanting to participate in IMF arrangements.

Interestingly the F-test proved that *jointly*, GDP per Capita, Total Reserves, Inflation, and Current Account Balance were the catalysing effects that influenced decisions of SSA countries that sought to participate in IMF agreements. (See, Section 4.4.1.2, *Table 4-7* for a summary of this analysis).

5.2.2 CATALYTIC EFFECTS OF FDI INFLOWS

The study found empirically and holding all **other factors constant**, that a country's **GDP per Capita, Total Reserves, Inflation, and Trade** influenced decisions of foreign multinational corporations and or investors in choosing to invest in Sub-Saharan Africa. GDP Growth, Current Account Balance and IMF participation were not significant in influencing investment decisions of multinational corporations and or investors seeking to invest in SSA.

Interestingly the study also revealed empirically (F-test) that *jointly*, Total Reserves, GDP per Capita, Current Account Balance, Trade, Inflation, IMF participation, and GDP growth, are the catalysing effects that influenced investment decisions of foreign multinational corporations and or investors when they sought to invest in Sub-Saharan African countries. (See, *Section 4.4.1.2, Table 4-7* for a summary of this analysis).

5.2.3 IMF AGREEMENTS AND FDI INFLOWS

The study established that **GDP per Capita** and **Total Reserves** were the catalytic effects for both IMF participation and FDI inflows in SSA. Accordingly, and based on these findings, the study revealed that IMF agreements catalysed FDI inflows in Sub-Saharan Africa. (See, *Section 4.4.1.3, Table 4-7* for a summary of this analysis).

5.2.4 IMF PARTICIPATION AND PREVIOUS IMF INTERVENTIONS

This research found that no association existed between countries that participated previously in IMF arrangements and foreign direct investment inflows. This is consistent with conflicting results in this respect. For instance, Mody and Saravia (2000), Brune *et al.*, (2004), and Al-Sadiq (2015), found positive correlation between countries with previous IMF interventions or arrangements and FDI inflows. In the same vein, Jenson (2004) found that a negative relationship existed between countries that participated in IMF arrangements and the levels of FDI inflows they attracted. Notwithstanding this, no correlation was established on catalysing effects between IMF arrangements and FDI inflows (Hajivassiliou, 1987; Faini *et al.*, 1991).

This study refuted the hypothesis that Sub-Saharan African economies or countries with previous IMF interventions were expected to attract more FDI inflows.

5.3 CONTRIBUTIONS FROM THIS STUDY

The conclusions from this study contributes immensely both practically and theoretically to the area of IMF agreements or arrangements and FDI inflows. Central to this study, determinants of IMF agreements or arrangements were ascertained for SSA countries. Further, determinants or catalytic effects of FDI inflows were corroborated. The study then linked this to establish if there were any catalytic effects or impacts of IMF agreements or arrangements that influenced FDI inflows into SSA. The empirical findings in terms of theoretical and practical contributions are discussed briefly below.

5.3.1 IMPLICATIONS FOR THEORY

5.3.1.1 IMF PARTICIPATION: SELECTION EQUATION

It was alluded above that catalytic effects of IMF agreements were jointly established for all four independent variables under the study. However, at an individual control variable level, Current Account Balance and Inflation did not influence IMF participation by SSA countries. Why the variables Current Account Balance and Inflation did not yield the expected positive signs is interesting and not the focus for this study. Recommendations are provided that this be an area to be investigated in detail by future studies.

It was highlighted that a country's propensity to seek IMF intervention may not have been clearly captured by the selection regression models given that some countries may have chosen to participate in IMF arrangements just to get hold of the IMF conditionality in order to improve their economic conditions and not necessarily to get financial assistance.

The implication for future research is therefore to explore deeply some of the drivers' specific to SSA countries. Possible reasons for this exist, for instance this could be attributed to engagement

motivations (Al-Sidiqi, 2015), group heterogeneity (Dabla-Norris & Gündüz, 2012) and non-linearity (Al-Sadiq, 2015).

Similarly, countries with high levels of inflation are expected to be deterrent for attracting IMF arrangements. Interestingly, inflation was found to be non-significant in influencing SSA countries to participate in IMF agreements. This phenomenon also needs further investigation.

5.3.1.2 FDI INFLOWS: OUTCOME EQUATION

For the outcome equation, all the independent variables that were expected to influence FDI inflows were ascertained to do so. That is, GDP per Capita and Total Reserves influenced FDI inflows into SSA. However, GDP growth and IMF participation (the endogenous variable), did not influence FDI inflows in SSA.

GDP growth is meant to be growth enhancing in the same way as domestic investment does. In fact, countries with more GDP growth rates attracted more FDI inflows than those without (Narendra, 2014; Artige and Nicolini, 2005). Hansen and Rand (2006) found no long-term impact between GDP growth and FDI inflows but a bi-directional causality from FDI and GDP. In other words, high levels of FDI inflows tended to imply high levels of GDP, and not the other way around. Implication of theory in this regard is to establish if there is a bi-directional relationship from GDP to FDI specific for SSA countries.

5.3.2 IMPLICATIONS FOR PRACTICE

Perhaps one of the most important implications at the core of this research is acknowledging, recognising and understanding the importance of catalytic effects of IMF arrangements or agreements on foreign direct investment (FDI) inflows in the context of Sub-Saharan Africa. Thus, catalytic effects of IMF agreements (GDP per Capita, Total Reserves) and the catalytic effects of FDI inflows (GDP per Capita, Total Reserves, Inflation and Trade), are essential in influencing SSA countries seeking to participate in IMF agreements and for foreign multinational corporations and investors wanting to invest SSA in economies. Further, for SSA countries seeking to participate in IMF agreements, an understanding on what some of these elements may cause to the macroeconomic structures of their economies is critical.

5.4 LIMITATIONS OF THE STUDY

This research used secondary fixed unpanelled data to examine the catalytic effects of IMF arrangements or agreements on FDI inflows in 41 SSA countries with IMF interventions for the period 1980 to 2015. Botswana, Eritrea, Namibia, Seychelles and Swaziland were excluded from the study as they did not receive any IMF assistance during this period. Their exclusion may or may not have influenced the empirical findings of this study.

Apart from the governance and reform factors (control variables), the study initially sought to include the good governance factors (corruption, effectiveness of governance, polity, quality of regulatory environment, type of government (democratic or autocratic), and accountability.

It was however found that the governance factors (variables) were only available for the period 1996 to 2015, which represented a 16-year gap given that the study period was from 1980 to 2015. Exclusion of these variables may or may not have influenced the empirical findings or results of this study. In particular, variables such as political stability, rule of law and government effectiveness have been debated extensively with regards to their influence and impact on IMF agreements and FDI inflows (Biglaiser & DeRouen, 2010).

The study also excluded the type and size of the IMF programs or arrangements that the countries participated in. It would have been interesting to establish whether the type and size of IMF agreements influenced FDI inflows in terms of size that the host countries attracted, positively or negatively. Lastly, the study did not explore the impact of IMF conditionality on the selection equation (IMF participation). A study of the literature found no reported studies to date that recorded correlation between IMF imposed conditions and a country's macroeconomic performance which potentially could impact FDI inflows.

In relation to the research approach, one of the drawbacks of panel data studies is that of collection issues in terms of sampling design and coverage (Baltagi, 2008). Collecting data for a 36-year period (1980 to 2015) for 41 countries across eight dependent variables (GDP per Capita, Total Reserves, Inflation, Current Account Balance, Trade, IMF Participation, and GDP Growth) proved to be challenging. Organisation of data into a panel data set proved very challenging as well. Lastly, a considerable amount of time was spent on learning and understanding, STATA the statistical tool used to perform the analysis of the data under in the study.

6 RECOMMENDATIONS FOR FUTURE RESEARCH

The central and focal research questions raised at the beginning of this study have been addressed. The study also uncovered additional issues to be addressed and explored in future studies. **First**, it is recommended that future studies in IMF agreements and FDI inflows incorporate good governance factors, as this may prove to be significant and crucial for policy makers and foreign multinationals or investors who seek to participate in IMF agreements and or direct investments to host countries.

Secondly, future studies should consider including the size and type of IMF programs or arrangements to ascertain if this has an influence or impact on the size of FDI inflows that a country may attract.

Thirdly, and especially in the SSA context, future studies must incorporate the impact that IMF conditionality may have on catalytic effects of IMF agreements for those economies that may seek IMF assistance.

Consequently, this study concluded that while much has been discovered in two distinct areas – IMF participation (selection equation) and FDI inflows (outcome equation) – there is still much to learn.

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8 APPENDICES

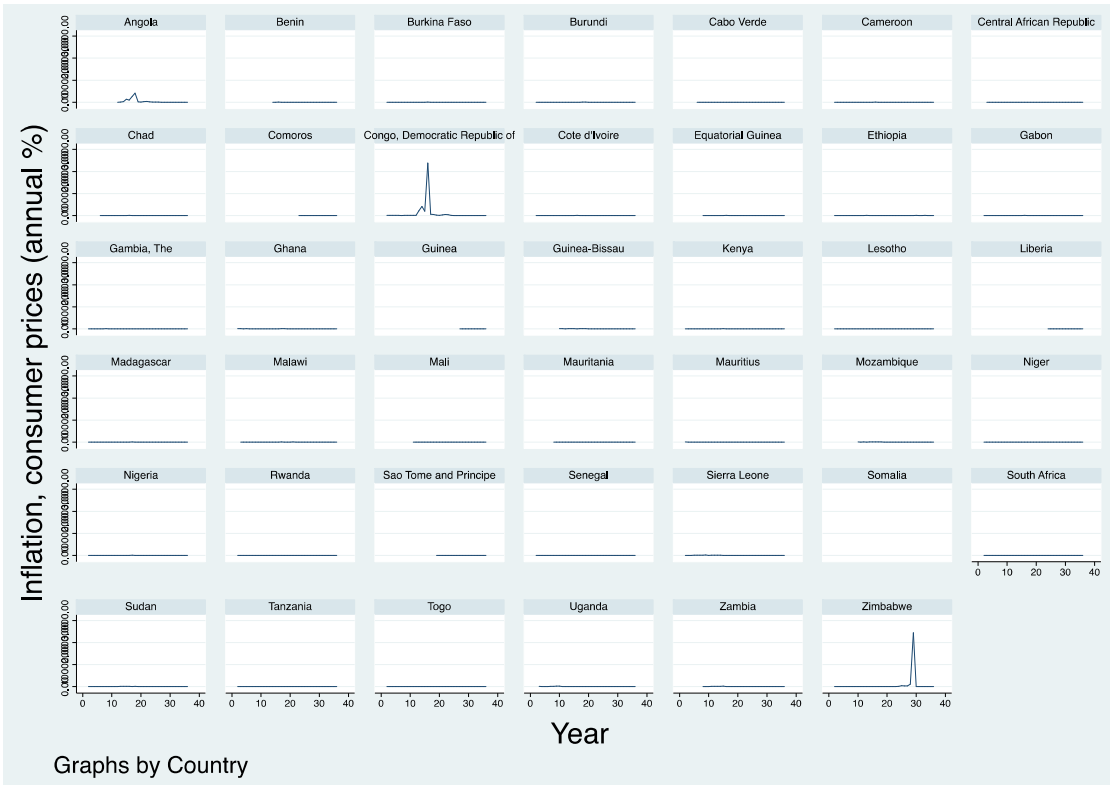
8.1 EXHIBITS

8.1.1 EXPLORING PANEL DATA VARIABLES

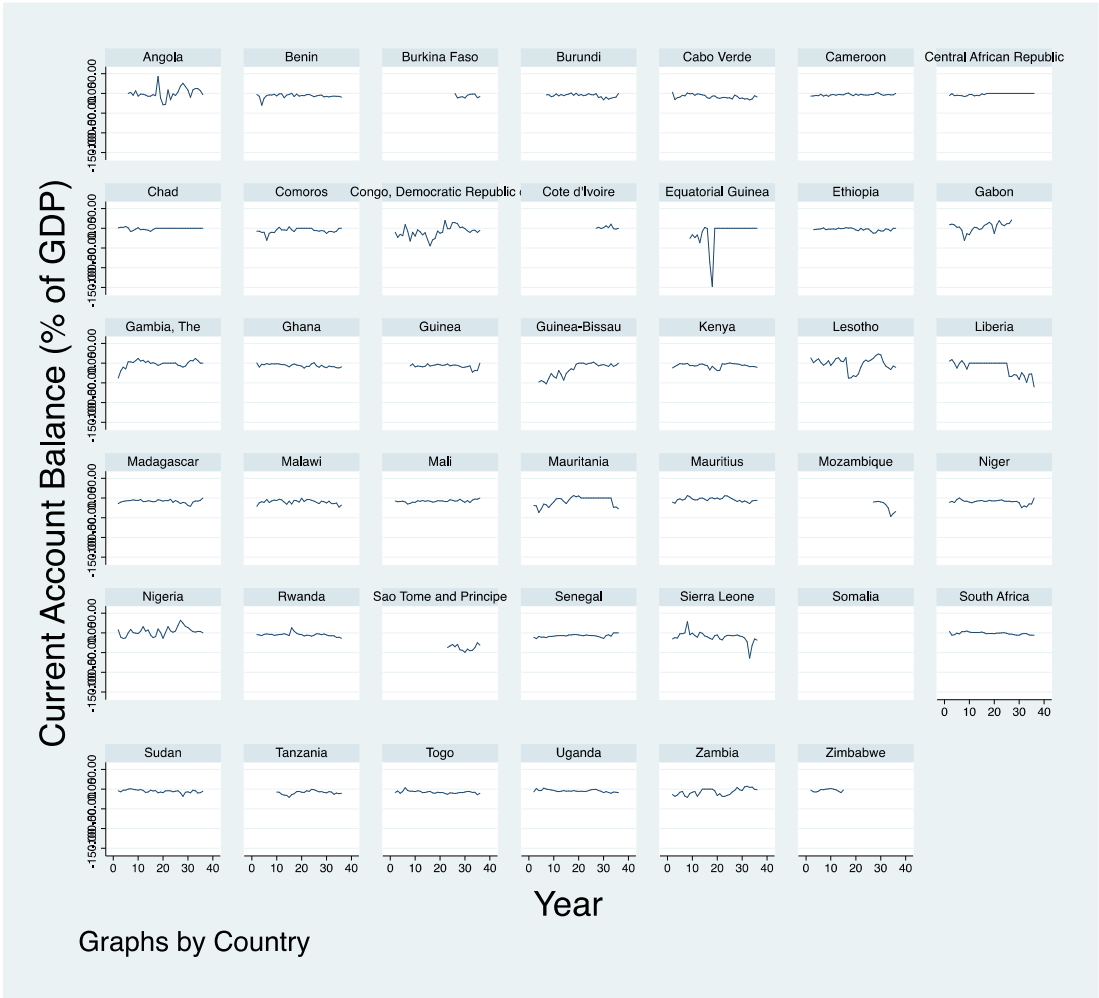
8.1.1.1 IMF PARTICIPATION



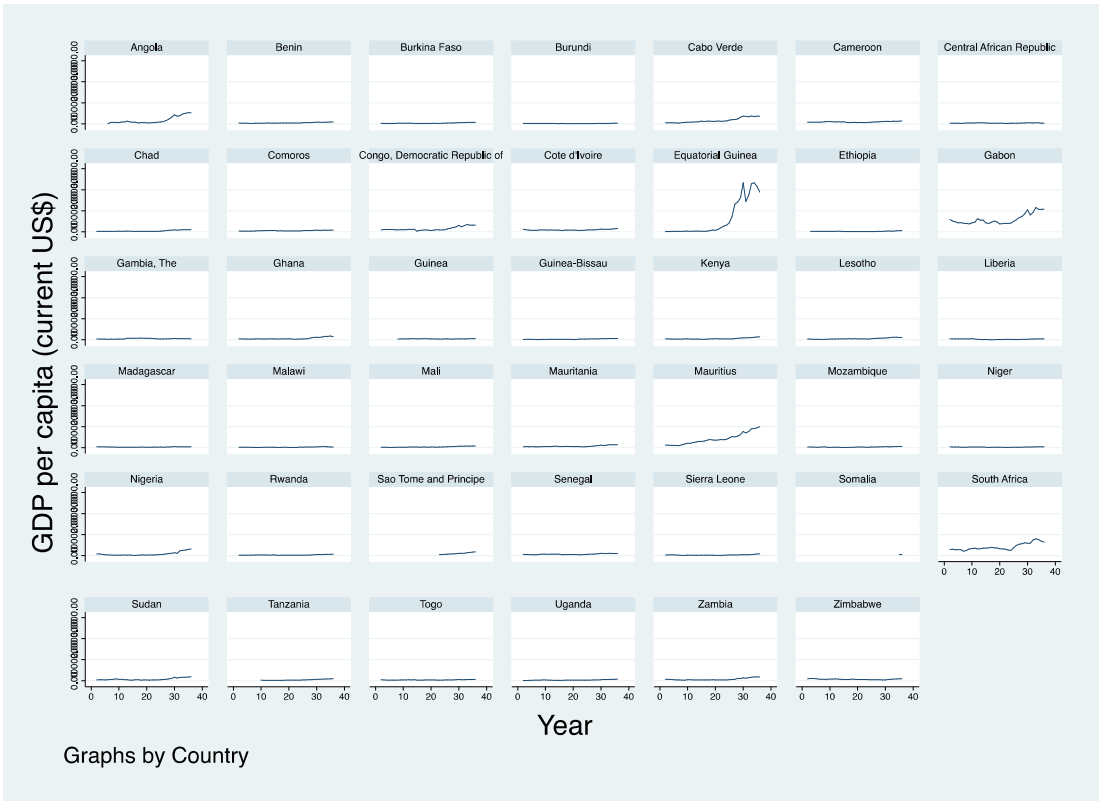
8.1.1.2 INFLATION



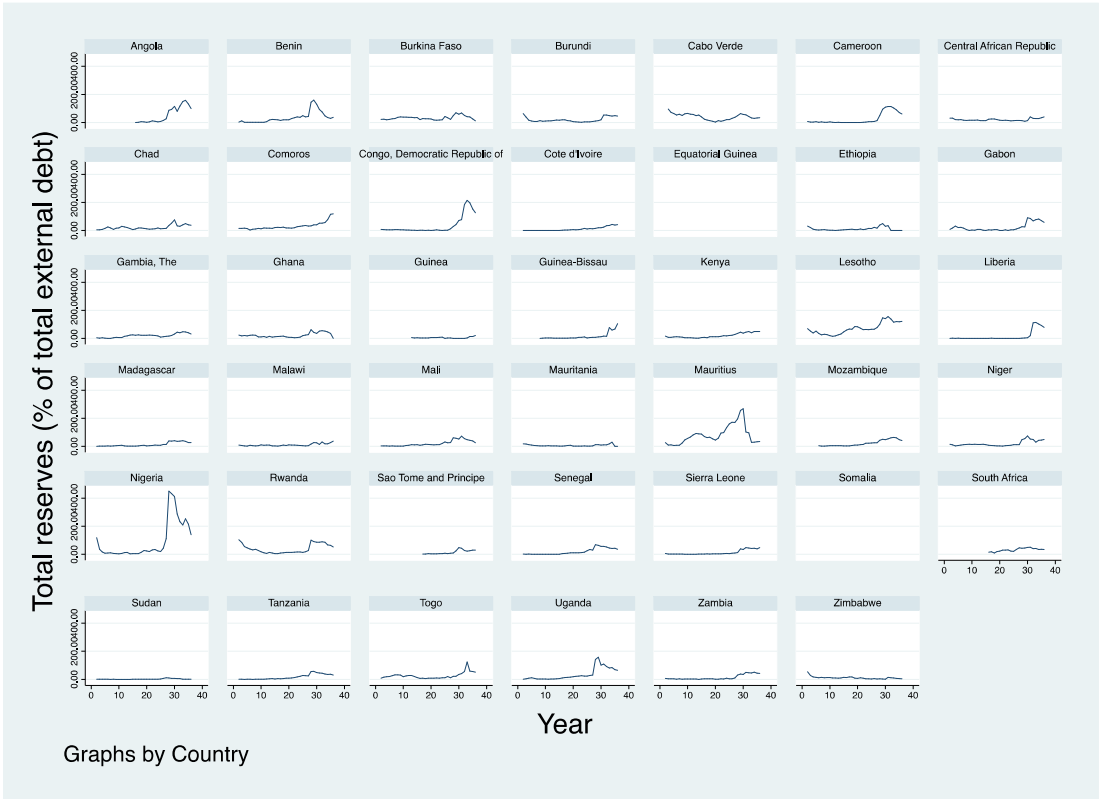
8.1.1.3 CURRENT ACCOUNT BALANCE



8.1.1.4 GDP PER CAPITAL



8.1.1.5 TOTAL RESERVES



8.1.1.6 FDI INFLOWS



Graphs by Country

8.2 DEFINITIONS OF VARIABLES AND THEIR SOURCES

Data used in this study was extracted from various sources, these are detailed below.

8.2.1 VARIABLES DEFINITION

Table 8-1: Definitions – Dependent and Independent Variables

Variable	Definition	Source
1. Current account balance (% of GDP)	Current account balance is the sum of net exports of goods and services, net primary income, and net secondary income.	International Monetary Fund, Balance of Payments Statistics Yearbook and data files, and World Bank and OECD GDP estimates.
2. GDP per Capita (current US\$)	GDP per Capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars.	World Bank national accounts data, and OECD National Accounts data files.
3. Total reserves (% of total external debt)	International reserves to total external debt stocks.	World Bank, International Debt Statistics.
4. Inflation, consumer prices (annual %)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.	
5. Foreign direct investment, net inflows (% of GDP)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity Capital, reinvestment of earnings, other long-term Capital, and short-term Capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.	International Monetary Fund, International Financial Statistics and Balance of Payments databases, World Bank, International Debt Statistics, and World Bank and OECD GDP estimates.
6. GDP growth (annual %)	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.	World Bank national accounts data, and OECD National Accounts data files.
7. Trade (% of GDP)	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World Bank national accounts data, and OECD National Accounts data files.
8. IMF Participation	A dummy variable equals one if a member country is under IMF arrangements at five months of the year and zero others	International Monetary Fund's <i>World Economic Outlook database</i>

Notes:

1. Source: World Bank (2016)